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FRACTURES OF THE MANDIBLE

BY STUART GORDON

Toronto

FRACTURES of the mandible, never rare, are being encountered more frequently. Whilst increased means and speed of transport, plus greater industrialization, no doubt account for much of this increase, the blow of a fist still accounts for many. It is my purpose to discuss a series of 43 cases, and to describe a new modification of an old method of treatment.

DIAGNOSIS

The diagnosis of a fracture of a mandible is, as a rule, easy. There is the history of an injury, followed by localized pain, swelling, interference with function, and frequently deformity. If the fracture is through the horizontal ramus the mucous membrane is torn in almost every instance. Malocclusion is present if there is any displacement of the fragments. Radiological examination should always be done. Not only should the site of the suspected fracture be pictured, but all the mandible should be x-rayed. Since complete radiological examination in each case of conjectured fracture has been insisted upon fewer single fractures have been noted.

ETIOLOGICAL FACTORS

Generalized and local disease of the bone can play a part in fracture of the mandible. Thus in one case in this series a fracture through an adamantinoma occurred when the patient bit into an apple. Trauma is, of course, the commonest factor, and may produce breaks either directly or indirectly. Sixteen cases in this group were the result of automobile accidents, thirteen resulted from blows of the fist, and such accidents as falling downstairs, a blow from a baseball, etc., accounted for thirteen.

Ten of the 43 occurred in females. The average for the entire group was thirty-four. The

sites of fracture are determined by the direction and force of the blow, local condition of the bone, number and location of teeth, shape of striking object, and whether or not the mouth was open at the moment of impact.

One fracture in the series was partial, *i.e.*, involved the alveolar ridge only. Thus 42 were complete. Of these 13 were single, 25 were double, and 4 were multiple. In all cases of single fracture either the condyle or the horizontal ramus was involved—never the ascending ramus. On the other hand the condyles were rarely involved in multiple fractures of the mandible (Fig. 1).

ANÆSTHESIA

Block anæsthesia, using 2 per cent novocain, was used in sixteen cases. The inferior dental nerve was blocked in each instance, bilaterally where necessary. Fifteen were done without any anæsthesia, five with avertin and nitrous oxide, and oxygen was used in five. Of these avertin is the least satisfactory. Whilst in the occasional patient it is satisfactory, others become restive when any attempt is made to manipulate the jaw.

TREATMENT

Hippocrates advised the fastening together of the teeth of the mandible in cases of fracture of that bone. He used gold wire, or, failing that, thread. He emphatically advised against the use of bandages in the treatment of any fracture of the jaw without displacement, stating that it tends to turn the fragments inwards. His advice on this point is just as applicable today as the day it was written. In cases where the fracture was complete he also used an external splint of leather gummed to the skin. The

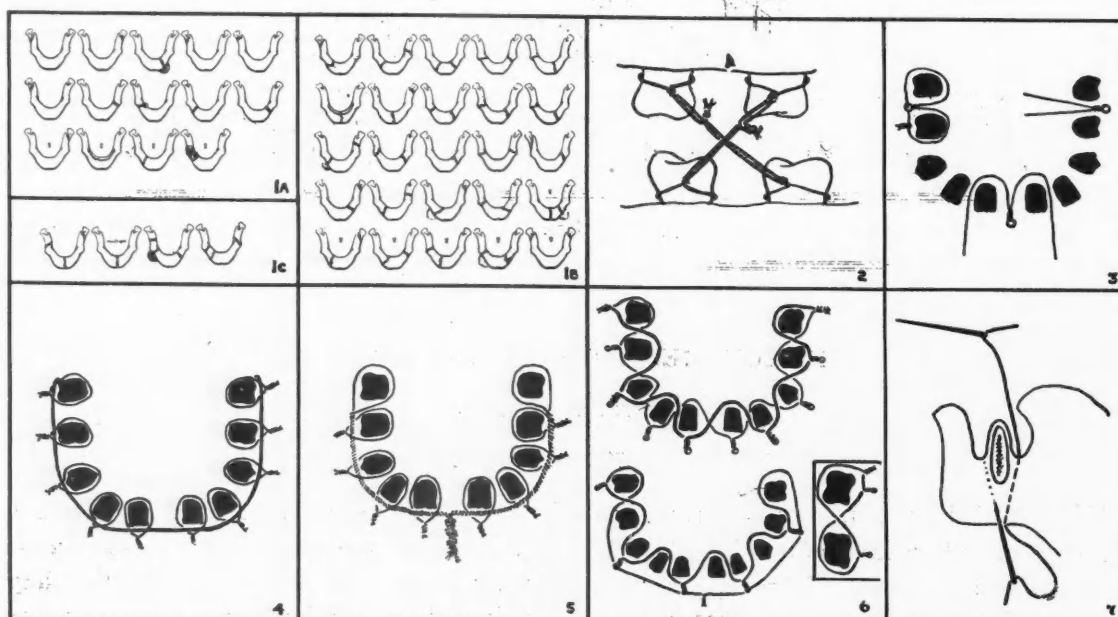


Fig. 1.—Location of single fractures is shown in A, double fractures in B, and multiple in C. The shaded areas opposite some fracture lines represent abscesses. **Fig. 2.**—Gilmer's method of applying tie wires. The teeth are shown separated in order that the details of wiring may be clear. In actual practice the teeth would be fastened in occlusion. **Fig. 3.**—The loop method of wiring is represented diagrammatically. Cross ties of wire or waxed silk may be used. **Fig. 4.**—The band method is shown. The heavy wire may be round, or half-round. In this, as in subsequent illustrations, the molars have not been included. **Fig. 5.**—Risdon's method of applying a band wire is illustrated. The firm fixation of each end of the band wire is indicated. **Fig. 6.**—Various methods of applying the in-and-out method are illustrated. **Fig. 7.**—This is a diagrammatic representation of a simple method of applying circumferential wires. The upper needle was pushed through the skin below the mandible and drawn out through the floor of the mouth, as shown. The second needle, threaded on the other end of the same piece of wire is passed through the same hole in the skin, and brought out between the lip and the mandible. The wire is see-sawed back and forth, firmly, two or three times and comes to lie against the body of the mandible.

patient was advised by him to lie on the sound side. A "low" diet was to be taken for ten days.

Just when the maxillary teeth were used first as a splint for the mandible does not seem to be definitely known. Guglielmo Salicetti is said to have used the method in 1269. Gilmer, in 1887, described a method of fastening mandibular to maxillary teeth, and is credited with popularizing the principle (Fig. 2). An improvement in the method was described by Ebby, by Oliver, and by Ivy, separately. Using a 24-gauge brass or iron wire, ends were passed about two adjacent teeth on the buccal surface, as shown in Fig. 3. The bicuspid and central incisors above and below were treated so. The wires were then passed through each two adjacent loops and tightened.

Another adaptation of the same principle consists in the use of band wires (Fig. 4). Here a rather thicker round or half-round wire is bent to lie against the teeth, from molar to molar, and is fastened to each tooth by finer wire (Sauer), or to just enough teeth to make it lie firm (Hammond). More recently Risdon has described a further modification of the band

wire which has the definite advantage of firm fixation at each end of the band (Fig. 5).

Edentulous jaws may be splinted by means of wire passed about the body of the mandible at three or four points and fastened over a moulded splint of dental compound (Fig. 8). Such a splint can be re-inforced by including in it a heavier piece of wire (*e.g.*, 16 gauge silver). Ivy places the wires in position by using a small trocar and cannula. For some time now I have been applying circumferential wires in the manner outlined in Fig. 7. This has the advantage of simplicity, as well as being efficient. Essentially it is the original method of circumferential wiring as described by Black.

Fractures occurring a short distance in front of the angle, and with the posterior fragment edentulous, produce a displacement which is difficult to treat. The posterior part is pulled forwards and upwards. To maintain it in proper position a wedge of modelling composition may be placed in the position of the missing tooth, or teeth, after reduction. The remaining teeth are then fastened together. A more efficient method is to pass a piece of silver or

stainless steel wire through a hole drilled near the angle of the mandible. Traction is obtained by fastening this wire to a jury mast extending down from a plaster headpiece with a piece of heavy elastic, or rubber (Fig 9).

A further modification of the methods of

fastening the teeth of the mandible to the teeth of the maxilla in cases of fracture of the mandible is shown in Fig. 6. It seems obvious to term it the in-and-out method. Both 25 and 28 gauge stainless steel wire have been used, the latter more frequently. A length of wire

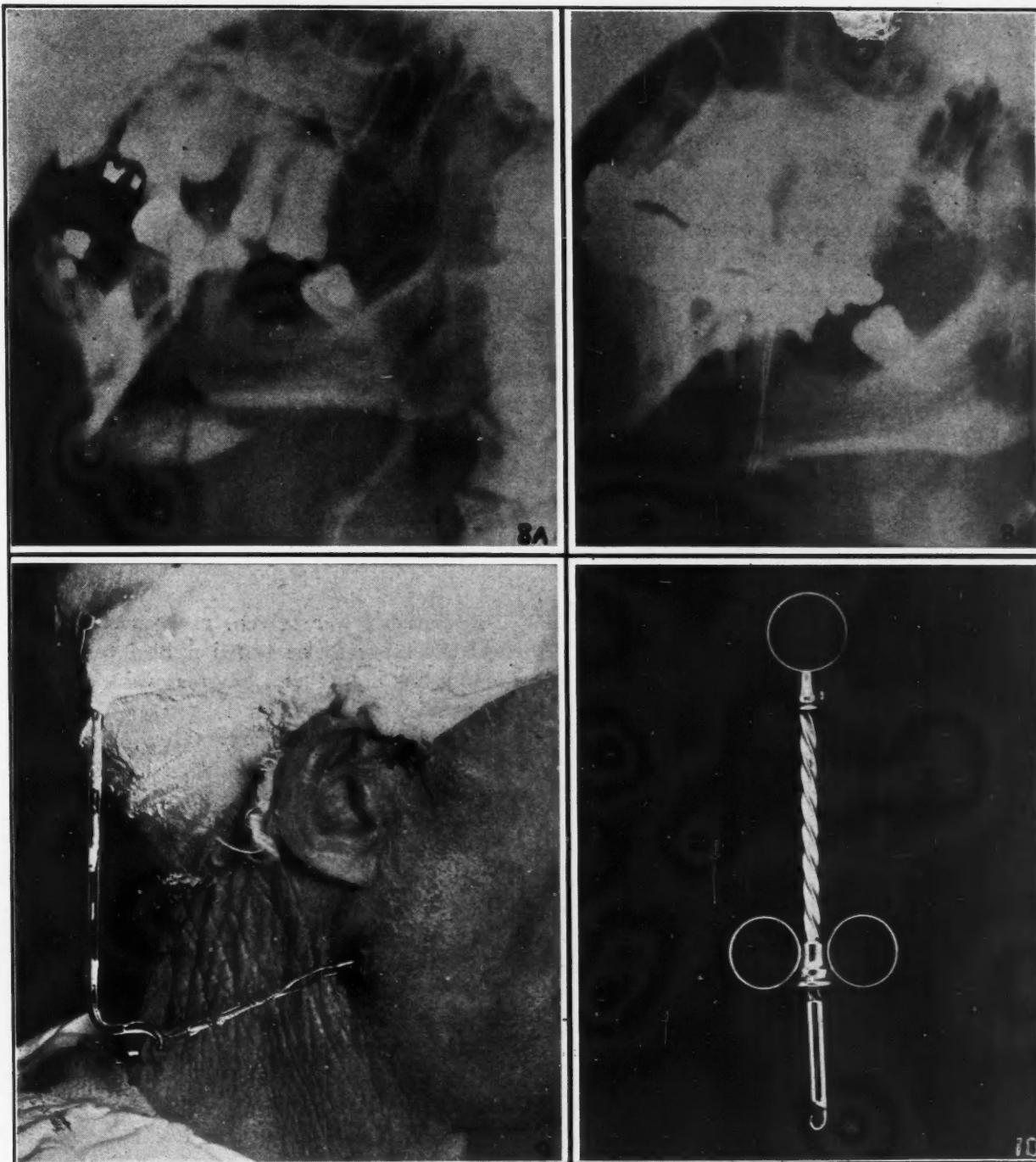


Fig. 8.—Circumferential wires may be seen passing about the horizontal ramus of the mandible. This patient suffered multiple fractures of the facial bones. The fractured mandible was treated by wiring the jaw to a modified cap splint as shown in the photograph. (The cap splint was made by Douglas Tanner, D.D.S.) **Fig. 9.**—One method of treating fractures just in front of the angle, and in which the posterior fragment is edentulous is shown. A hole has been drilled through the angle and a loop of silver wire tied through it. Continuous traction is applied to this loop by means of a heavy elastic band fastened between the loop and a jury mast extending down from a plaster of Paris cap. **Fig. 10.**—The looper is shown with the traveller at the lower end of the thread. When the traveller goes the complete length of the threaded area the hook makes two revolutions.

is passed between two teeth, molars or bicuspid, and then in and out between the teeth until a corresponding tooth on the other side is included. In each instance where the wire lies on the buccal surface of a tooth a loop is formed in the wire. This can be done with a snap, but in order to make this manoeuvre faster and the loops symmetrical the looper shown in Fig. 10 was devised. When the traveller passes the full length of the threaded portion of the instrument the hook makes two complete revolutions. Loops are thus identical as to size, shape, and length from the line of the wire, and are quickly and easily formed. A second wire, if considered necessary, is then passed between the teeth, passing on the buccal surface of the teeth missed by the first wire (*i.e.*, those in which the first wire passed on the lingual surfaces). Loops are fashioned as before. The ends are twisted together at each end. Similar wires are applied to the other set of teeth. If after fastening some looseness is apparent in the line of wire it is a simple matter to tighten the loops with the looper, and so take up the slack. The large number of loops gives the operator sufficient range to apply ties at the most efficient angle. This is of definite value in those cases where reduction cannot be carried out immediately and elastic ties are used to effect this over a period of days. Cross ties of waxed silk are used, since separating the jaws, should that be necessary, is then but the work of a moment. Finally, cap splints, fashioned from a model of the patient's teeth, and fastened to the teeth after reduction, may be used. They are highly efficient, call for considerable technical skill, and are relatively expensive.

Any method used in the treatment of fractures of the mandible must meet the two fundamental requirements of accurate reduction and adequate immobilization. Secondary factors such as speed and facility of application, comfort, economy, and ease in cleansing of teeth, have all to be considered. The in-and-out method is very easy to apply, and can be done very quickly. Free ends of wire are at a minimum; in fact, the wires from each end can be turned out of the mouth and back over the cheek, in which case all ends are outside and, therefore, cannot irritate.

The question of extraction of a tooth, or teeth, lying in the line of fracture is of some importance. Leaving such a tooth in position

increases the possibility of the development of infection. While as a general rule the extraction of the tooth is advised, I have come to leave such teeth in in all patients with mouths in good shape (really private patients), and to remove them in all cases where the teeth have been uncared for, unless the tooth is necessary for the maintenance of the reduction.

Fractures involving the horizontal ramus of the mandible, since they are usually compound, should be immobilized without delay. It is said there is less chance of serious infection developing.

Twenty-four of the 43 cases were treated by wiring. Two of these required elastic traction for two days before being fastened in occlusion. In one case the lower teeth were fastened to an upper plate, and then a narrow moulded plaster of Paris bandage applied about the jaw and over the head. Band wires were used in four cases, five were treated by external traction applied at the angle, one patient refused treatment, two were treated by external fixation to a jury mast, four were treated by circumferential wiring, one patient had half of the mandible resected, and one patient died.

FOOD

All patients were given, necessarily, a fluid diet. To this may be added puréed vegetables. Pabulum has been found of great value. It has not been found necessary to extract a tooth in order that the patient may take nourishment, nor has it been necessary to pass a duodenal tube through the nose.

COMPLICATIONS

Complications in this series were relatively rare. Six patients developed abscesses. These were all in cases involving the horizontal ramus. All cleared up rapidly following incision and drainage. One patient developed actinomycosis. The lesion was treated by incision and drainage of the fluctuant areas, followed by surface applications of radium. She healed promptly and has remained so for two years.

Delayed union occurred in one case. Solid union resulted after the removal of a small sequestrum. Non-union occurred twice. In one instance it was due to non-reduction, and in the other to faulty immobilization.

RESULTS

Thirty-five obtained an immediate good result from treatment. One healed after sequestrec-

tomy. The other example of delayed union never returned to hospital so the end-result is unknown.

As stated above there were two fractures which failed to unite. One was treated successfully by open operation and wiring with silver wire, the other united after again being reduced five weeks after her injury and well immobilized.

One patient died. His face was smashed dreadfully in an automobile accident. His only treatment was the reduction of a fracture at the symphysis, and wiring the adjacent teeth together, exactly as outlined by Hippocrates for such fractures. The patient died of meningitis within sixty hours of the accident.

CONCLUSION

Forty-three cases of fractures of the mandible have been discussed. The various methods of treatment have been touched upon, and a new technique in wiring has been described.

SUMMARY

1. Fractures of the mandible are becoming commoner.

2. Automobile accidents are accounting for an increasing number.

3. Clinical diagnosis is usually simple.

4. Radiological examination of the entire mandible should be done in every case of suspected fracture of the mandible.

5. The in-and-out method of wiring is a very efficient method of treatment.

6. Good results are obtained if accurate reduction is carried out and immobilization maintained.

7. Complications are few, considering the number of fractures of the mandible that are compound.

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A SKIN TEST FOR SUSCEPTIBILITY TO PERTUSSIS*

BY LYON P. STREAN

Montreal

WHOOPING-COUGH is a disease which constitutes one of the major problems confronting the pædiatrician and public health officer. The realization of its importance as a cause of infantile mortality and of morbidity in later life has, in recent years, directed the efforts of investigators towards effective measures designed to control the disease. Sauer¹ states that in the United States some 200,000 cases are reported annually with an average of 5,200 deaths—one death for every 39 cases of whooping-cough reported.

There are several reasons which account for this rather unsatisfactory situation. Whooping-cough is a highly contagious disease, and contact during the incubation period causes profuse dissemination of the organisms responsible for the malady. As a contributing factor, quaran-

tine is very often delayed. Most particularly, specific prophylactic measures have up to the present been of doubtful value. Indeed, the injection of pertussis vaccine not infrequently causes serious reactions and even death in young infants (Madsen²)—the very group most in need of protection. There is, therefore, considerable need for a reliable test to determine which individuals are susceptible, *i.e.*, which are most urgently in need of specific immunization.

It is the purpose of this communication to describe an endotoxin derived from *H. pertussis*, phase I, which can be used as an effective skin test, specific to pertussis, and bearing the same relationship to pertussis as the Schick test does to diphtheria.

Skin tests for susceptibility to pertussis have been attempted by many investigators. As early as 1921 Modigliani and de Villa³ reported skin reactions in children suffering from whooping-cough by the intracutaneous injection of a suspension of *H. pertussis*. Riesenfeld,⁴ Hull and

* From the Research Laboratories of Ayerst, McKenna and Harrison, Ltd., Montreal.

From the thesis submitted in partial fulfilment of the requirements for the Master in Science degree in Bacteriology at McGill University.

Nauss,⁵ Toomey and McClelland,⁶ Truschina *et al.*,⁷ and Bonnet,⁸ working with vaccines, filtrates and extracts, concluded that the skin reactions observed were of no specific value. Siebler and Okrent⁹ used a phenolized vaccine containing 10,000 million organisms per c.c. obtained positive reactions in 80 per cent of children with no previous history of pertussis and negative reactions in 76.4 per cent of those giving a history of having had the disease. Paterson *et al.*¹⁰ and O'Brien¹¹ also reported positive and negative reactions with the use of vaccines. Paton¹² found that the intradermal test could not be linked with specificity and could not be correlated with the complement fixation test. Thompson¹³ produced an extract from *H. pertussis* which he reported gave positive and negative reactions. His work was suggested by the previous work of Krueger.¹⁴ Thompson called his material an endotoxin, although in 0.5 c.c. quantities it was without effect in mice, and, moreover, he admitted that the reactions in human skin were allergic, being positive in recovered cases. Demnitz *et al.*¹⁵ resumed the studies of Teissier *et al.*¹⁶ and produced an endo-

toxin capable of eliciting skin reactions in rabbits, but they found their material to be unstable and did not consider it suitable for human use.

The endotoxin used in the tests reported in this paper is stable over a period of months and produces positive skin reactions by virtue of its primary toxicity. The character of the endotoxin will be the subject of further communications. It was extracted from the organisms by physical means and was found to be lethal for mice in high dilution. It is capable of producing dermo-necrosis in the skin of rabbits or guinea pigs. The lesions produced in these animals resemble those produced by the living organisms.

The lethal effect of the endotoxin for mice is shown in Table I, while the dermo-necrotic effect on rabbits is indicated in Table II, and in the accompanying photograph (Fig. 1).

TABLE I.
LETHAL EFFECT OF ENDOTOXIN ON MICE
(AVERAGE OF 5 BATCHES)

Dilution of endotoxin	Volume	Wt. in mg.	24 Hours		48 Hours	
			D	S	D	S
1/30	1 c.c.	11.130	10	0	10	0
1/60	1 c.c.	5.565	10	0	10	0
1/120	1 c.c.	2.783	10	0	10	0
1/240	1 c.c.	1.392	10	0	10	0
1/480	1 c.c.	0.696	7	3	9	1
1/960	1 c.c.	0.348	0	10	0	10
M.L.D. 1/300	1 c.c.	1.113				

D = Dead
S = Survived

TABLE II.
DERMO-NECROTIC EFFECT OF ENDOTOXIN ON RABBITS
(AVERAGE OF 5 BATCHES)

Dilution of endotoxin	Volume	Wt. in mg.	Result in 72 hours
1/30	0.2 c.c.	2.260	Necrosis
1/60	0.2 c.c.	1.130	Necrosis
1/120	0.2 c.c.	0.565	Necrosis
1/240	0.2 c.c.	0.283	Necrosis
1/480	0.2 c.c.	0.142	Necrosis
1/960	0.2 c.c.	0.071	Necrosis
1/1920	0.2 c.c.	0.036	No necrosis

Minimal necrotizing dose, 1/960 = 0.071 mg. endotoxin

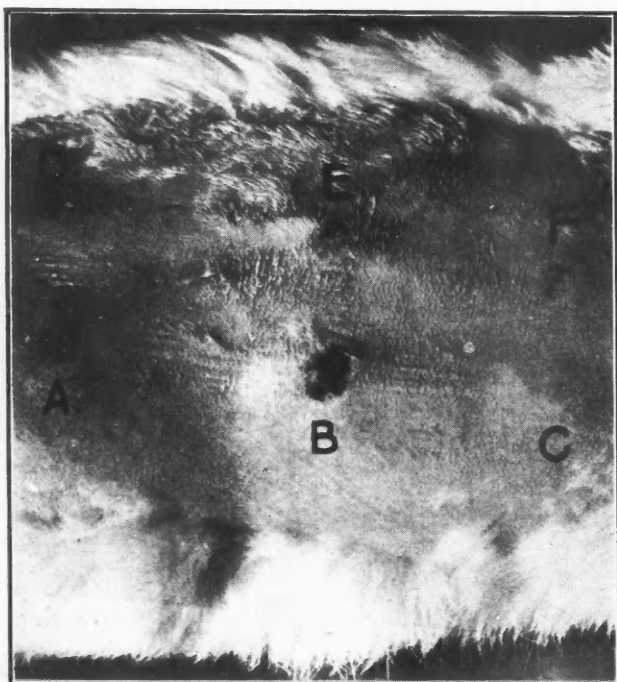


Fig. 1.—Rabbit showing dermo-necrosis with increasing dilution of pertussis endotoxin. Seventy-two hours after injection. Volume injected intradermally 0.2 c.c.

A	Dilution	1/30	containing	2.260 mg.	endotoxin.
B	"	1/60	"	1.130 mg.	"
C	"	1/120	"	0.565 mg.	"
D	"	1/240	"	0.283 mg.	"
E	"	1/480	"	0.142 mg.	"
F	"	1/960	"	0.071 mg.	"

Through the courtesy of Dr. R. R. Struthers, and under his supervision at the Children's Memorial Hospital, Montreal, the endotoxin was subjected to clinical trial, to determine its ability to elicit positive skin reactions in children possessing no circulating antibody against pertussis endotoxin and to show a negative reaction in those children presumed to be immune to the

disease. The test dose ultimately chosen was 0.1 c.c. of 1:600 dilution, which was equivalent to 1/20 M.L.D. for mice. The results were as follows:

TABLE III.
SKIN TEST—PERTUSSIS ENDOTOXIN
CHILDREN'S MEMORIAL HOSPITAL
MONTREAL
No. of children tested: 100
Dose: 0.1 c.c.; dilution 1/600

		<i>All children tested</i>	<i>Infants</i>	
A.	History of whooping-cough ..	17	0%	
	Toxin-negative	19	30%	
	Toxin-positive	81	70%	
		<i>Children 8 and over</i>		
	History of whooping-cough ..	21%		
	Toxin-negative	16%		
	Toxin-positive	84%		
		<i>Children 8 and over</i>	<i>Under 8 years</i>	
B.	Questionable history of whooping-cough	15	2	
	Toxin-positive	10	1	
	Toxin-negative	5	1	
			<i>Between</i>	
	<i>6 Hours</i>	<i>12 Hours</i>	<i>24 Hours</i>	<i>6-24 hours</i>
	Positive 42	57	56	81
	Negative 58	43	44	19

TABLE IV.
RETEST ON NEGATIVES AND DOUBTFULS
No. of children assayed: 38
Dose: 0.1 c.c.; dilution 1/300

Toxin-positive	36
Toxin-negative	2

TABLE V.
RETEST ON POSITIVES
No. of children assayed: 37
Dose: 0.1 c.c.; dilution 1/1200

Toxin-positive	28 = 75%
Toxin-negative	9 = 25%

DISCUSSION

From the standpoint of public health, if whooping-cough is to be controlled adequately, specific immunization with a more effective antigen than those in current use is essential. There are many who question the value of pertussis vaccines in human prophylaxis, and in animals such vaccines merely induce a state of resistance whereby inevitable death on experimental infection is merely delayed. It is clear that a new approach to this matter of pertussis immunity is necessary. The endotoxin isolated in these experiments fulfils in experimental

animals all the requirements that vaccines lack, in that the endotoxoid prepared from it protects fully against multiple lethal doses of living virulent organisms. Moreover, an effective anti-endotoxin can be produced in rabbits which will neutralize the effect of either endotoxin or living organisms.

Whilst the clinical trial at the Children's Memorial Hospital on the endotoxin as a skin test was done on a comparatively small group, nevertheless the correlation of those reacting negatively to the endotoxin with those immune to the disease indicates a high degree of specificity. The increased percentage of negatives in the infant group is not surprising, and is probably due to the passive transference of antibodies through the placenta from mother to child.

It seems reasonable to suppose that the assessment of any immunizing procedure will be enormously facilitated if it can be made on a simple test rather than on statistical investigation after exposure to whooping-cough cases. The skin test described in this paper offers such an opportunity.

The skin test must be watched carefully between the sixth and twenty-fourth hour, as the erythema which develops, measuring from 1 to 3 cm. in diameter, may come on early and fade rapidly; or be delayed and not show up for 24 hours. There is obvious practical difficulty in making frequent observations over a twenty-four hour period, and methods of obviating this are being studied at the present time.

The results of skin tests on human beings would suggest that immunity in adults against whooping-cough is not nearly so profound as previously believed. Positive skin tests in older children and adults have been surprisingly high. This affords support for the opinion of some clinicians that whooping-cough in the older age groups has a milder, atypical course, and in the absence of bacteriological diagnosis such cases will be missed.

This skin test appears to bear the same relationship to whooping-cough as the Schick test does to diphtheria. Should pertussis endotoxoid and anti-endotoxin have the same protective power in human beings as they appear to have in susceptible animals, one might well anticipate a new form of treatment for the susceptible child and those already exposed, with a possible control of morbidity and high mortality.

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GRANULOMA PYOGENICUM*

(A REPORT OF FOUR CASES TREATED BY ROENTGEN RAYS)

BY DAVID EISEN, M.B., M.Sc. (MED.)

Toronto

GRANULOMA pyogenicum is a disease of the skin characterized by a reddish wart-like, usually pedunculated, tumour resembling granulation tissue. The condition was first described by Poncet and Dor¹ in 1897 under the name of botryomycosis hominis because of its superficial resemblance to a disease seen in horses. In the German literature this affection is referred to as granuloma telangiectaticum or granuloma pediculatum. Crocker,² in 1903, gave it its present name, and the first cases in the American literature were described by Hartzell³ in 1904. About 400 cases have been reported in the literature up to 1936.⁴ It is likely, however, that the disease is more common than this figure would indicate and that the paucity of the reported cases is accounted for by the comparative clinical insignificance of the lesion.

The pathogenesis of the condition is still unsettled, some^{5, 6, 7} regarding it as a true neoplasm, while others^{8, 9} believe it to be inflammatory in origin. Andrews¹⁰ synthesizes both views, regarding the nodules as "neoplastic vegetations . . . secondary to infections by the pyogenic cocci". Various organisms have been recovered from the lesion, most commonly *Staph. aureus*, but their etiological significance is open to question. In about half of the reported cases there is a history of previous injury of a trivial character (e.g., a needle prick) from a few days to several weeks before the appearance of the tumour.

From a study of several large series of cases^{4, 11, 12} it would appear that the condition is twice as common in females as in males. This might be explained by the fact that although it occurs in all occupations, it is very frequently reported in housewives who are particularly prone to minor injuries about the hands. The disease occurs at all ages but seems most common in the 4th and 5th decades.

The usual locations are the exposed surfaces of the body—the face (including the mouth) and hands. These areas in one large series¹¹ accounted for 76 per cent of the cases. The lesions may vary in size, location being a possible determining factor, but are usually about the size of a pea. The nodule is apt to be spherical in shape, and more than half of the cases have a distinct pedicle which is surrounded by a ring of macerated epithelium. Sessile, flattened tumours, occasionally partly crusted over, are sometimes seen on the palm. The surface is usually lobulated, giving it a raspberry-like appearance. The colour of the untreated tumour is a shade of red; the younger tumours may be brighter; treated nodules may be quite dark. The consistency is rather firm and it is not as friable as ordinary granulation tissue. Multiple tumours are not seen. Slight hæmorrhage is a frequent symptom. Suppuration is found in some but not in all cases. Some writers would restrict the name granuloma pyogenicum to the purulent cases, the others being classified as granuloma telangiectaticum.

* From the Department of Radiology, Mount Sinai Hospital, Toronto.

The onset is insidious, but, once started, full growth may be attained in from 4 to 6 weeks. Growth seems to be self-limited. It has been observed that if snipped off the tumour will recur and grow to its previous size and no further. It is usually not painful and is not tender on manipulation.

The histology is basically that of granulation tissue. There is a proliferation of fibroblasts and some endothelial cells with formation of many capillaries. These newly-formed blood vessels may be of such numbers and size as to suggest angioma. Characteristic, however, is a cellular infiltrate in which lymphocytes, plasma cells, and polymorphonuclears predominate, which serves to differentiate the two conditions. The epidermis overlying it may show ulceration, acanthosis, or hyperkeratosis (Fig. 1).

type of therapy does not seem to matter so long as it is thoroughly destructive. The commonly recommended modalities are curettement, electrocauterization, electro-desiccation, and the use of carbon-dioxide snow. Roentgen therapy, where mentioned at all in the literature, is usually dismissed very briefly. It has been thought advisable, for this reason, to draw attention to the efficacy of roentgen therapy in this disease by reporting four cases in which a permanent cure resulted from the use of this modality alone.

CASE 1

Mrs. E.A., aged 54, referred on February 11, 1936, from the out-patient clinic, for roentgentherapy for a small nodule on the right thumb of 7 weeks' duration. About Christmas, 1935, she had felt some pain in the right thumb "as if there was a thorn there". She searched for it with a pin but could find none. A few days later, a small, red lump appeared in this area. Later it became covered by a crust which would



Fig. 1



Fig. 2



Fig. 3

Fig. 1.—Low power microphotograph of granuloma pyogenicum showing (F) fibroblastic proliferation; (C) newly-formed capillaries of various sizes; (R C) round cell infiltration with a small abscess near bottom; (A) acanthosis. Fig. 2. Case 3.—A typical pedunculated lesion on the palm of the hand. Fig. 3. Case 4.—A sessile lesion on the palmar surface of the finger.

The typical lesion, once seen, can be easily recognized. Flat, sessile tumours may resemble chancre. On the lower lip the condition may be mistaken for epithelioma. The latter, however, is firmer, has a harder edge, and is more destructive. The nodule feels firmer than angioma, but occasionally histological examination alone can distinguish between this condition and angioma, angiosarcoma, and hæmangio-endothelioma.

There are no complications except, rarely, a regional lymphadenitis. The condition is benign but will return if not thoroughly treated. The

occasionally be pulled off, resulting in slight bleeding. On examination there was a pea-sized, raspberry-like excrescence on the lateral side of the last phalanx of the right thumb. Traction on it revealed a pedicle protruding through a collar of discolored skin. X-ray showed no foreign body but some slight rarefaction of the bone under the nodule. The patient was given 5 x-ray treatments at weekly intervals, totalling 750 R. The technique was 80 Kv., 5 Ma., 0 filter, 30 cm. distance, which, in our set-up, gave an out-put of 150 R in 1 minute. The condition disappeared completely one week after the last treatment and has not returned.

CASE 2

J.S., aged 36, factory foreman, referred to my office by Dr. D. Kasler on November 25, 1936, for x-ray treatment for a lesion on the right middle finger of 6 weeks' duration. He stated that he had cut his

finger on some binding twine on October 3, 1936. Twelve days later it began to bother him and his doctor found some granulation tissue in this area which he curetted but without permanent result. On examination there was a reddish, pedunculated lesion on the palmar aspect of the second joint of the right middle finger. It was about 5 mm. in diameter, rounded, flattened, and somewhat embedded in the skin, but traction showed it to have a pedicle. The patient was given 4 treatments, each 111 R at an average of 6 day intervals, at 105 Kv., 5 Ma., 1 mm. al. filtration, at 30 cm. distance. There was complete and permanent healing.

CASE 3

Mrs. F.L., aged 28, housewife, was referred from the out-patient clinic on December 4, 1936, for roentgenotherapy. She had noticed on the palm of her right hand, 6 weeks previously, what had appeared as "a tiny hole" followed later by a lump. Later "the skin disappeared from over it" and it bled frequently. Examination showed a small granuloma, reddish in colour, about the size of a pea over the thenar eminence of the right hand (Fig. 2). Four weekly treatments were given to a total dose of 666 R at 100 Kv., 5 Ma., 1 mm. al. filt., at 30 cm. distance. After the second treatment the tumour appeared blackish and more freely movable, and it was completely healed after the last treatment.

CASE 4

Mrs. J.O., aged 27, housewife, was referred from the out-patient clinic on December 18, 1936, because of a bleeding nodule on the left fourth finger of 3 months' duration. Examination disclosed a small granuloma, flattened and apparently sessile, about 5 mm. in diameter, on the palmar surface of the terminal phalanx of the left finger (Fig. 3). She was given a total of 516 R in 4 treatments at weekly intervals, the technique being as in Case 3. The condition healed satisfactorily.

SUMMARY AND COMMENT

Granuloma pyogenicum is characterized by a reddish, pea-sized, pedunculated lesion, resembling granulation tissue, occurring on the exposed surfaces of the skin, prone to ulceration and hæmorrhage and benign, but tending to recur unless completely extirpated.

A microscope that "sees" by electrons, or particles of electricity, instead of light, and that can reach so far into the depths of matter that eventually it is expected that it will be possible to "see" atoms themselves was demonstrated recently to members of the American Philosophical Society by Dr. V. K. Zworykin. This latest electron microscope achieves magnifications of 25,000 to 30,000, instead of about 5,000, maximum with even ultraviolet light optical microscopes. First research application of the perfected electron microscope is expected to be in biological fields. It is considered possible that the new microscope may help solve the problem of the nature of the viruses that cause certain unconquered diseases. Already in preliminary work unidentified particles evidently associated with disease germs, but hitherto unsuspected, have been seen. Extremely fine particles in materials of industrial importance, such as rubber latex, are shown to have shapes different from those they were believed to have.—*Science News Letter*, May 4, 1940, p. 277.

Our 4 cases included 3 females, all housewives, and 1 male. In the latter there was a definite history of trauma. The average age was 36. The duration varied from 6 weeks to 3 months when first seen. The lesions were about the size of a pea or smaller. In 3 of the cases bleeding was the main complaint. The total dose required varied between 444 R and 750 R, fractionated into 4 or 5 treatments at weekly intervals. Either 80 Kv. without filtration or 100 Kv. with 1 mm. al. filtration was used with 5 Ma. at 30 cm. distance. The lesions disappeared about 1 week after the 4th or 5th treatment. All the cases were treated during 1936. In none has there been recurrence.

On the basis of the satisfactory results obtained by a treatment which is non-operative and painless, it is felt that roentgen therapy is an advantageous method of treating granuloma pyogenicum.

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Moderately priced binoculars, thanks to a new coating for their lenses, can be made as effective as more expensive instruments of the past with untreated lenses on account of a development by Dr. John Strong of the California Institute of Technology, reported by W. C. Miller of Paramount Pictures to the Society of Motion Picture Engineers at Atlantic City. Paradoxically, by coating lenses with a transparent film of the order of a millionth of an inch thick about 85 per cent of the surface reflection is eliminated and the light no longer reflected goes through the lenses and makes the vision more effective. This reflection-suppressing trick is being used wherever optical glass lenses are being used, in microscopes, cameras, motion picture cameras, motion picture projectors, etc. Motion picture projector lenses treated with the new film show a 50 per cent increase in screen brightness, it is reported.—*Science News Letter*, May 4, 1940, p. 281.

UNILATERAL MULTILOCULAR CYSTIC KIDNEY*

(REPORT OF A CASE IN A YOUNG CHILD)

BY W. A. DAKIN, M.A., M.D., C.M.

Regina

MOST cystic conditions of the kidney are of sufficient rarity to invoke more than passing interest. The fact that the mechanism of cyst-formation and the underlying pathological and developmental changes concerned are not yet fully understood gives an additional fillip for study when a case presents itself.

Although the incidence of cystic disease may vary somewhat in different areas, one feels that, in ordinary urological practice, cases of cystic diseases of the kidney are few and far between. In some 400 patients on whom complete urological study was carried out by the writer in 1938, only 3 cases of cystic disease associated with the urinary tract were found: first, the case being presented; second, one case of polycystic kidneys; third, an unusual case of a cyst of the lower end of the ureter herniating into the bladder.

A brief classification of cystic diseases of the kidney is as follows:

1. The usual common type of polycystic kidney which appears to bear little relationship to the case here presented, etiologically or otherwise. This condition, of course, is bilateral, although the process may be much more advanced on one side than the other. It is frequently referred to as congenital and hereditary, is associated on occasion with cysts in the liver and other organs, and appears as an infantile and an adult type. We are familiar with the adult type which often times reaches a dramatic climax in a man forty to fifty years of age, who has not been feeling very well for a few weeks or longer, and arrives in hospital in coma due to renal insufficiency.

2. Simple cysts: (a) Small multiple retention cysts associated with infections and localized tubular obstructions, considered to be acquired. (b) Large solitary cysts. These latter are usually unilateral and may attain great size without affecting the integrity of the kidney. Some 250 cases have been reported up to two or

three years ago. Hinman¹ states that "the cysts occur with somewhat more frequency in the female than the male. Very few cases have been found in children, either clinically or at autopsy." The condition would appear to be acquired.

3. Large multilocular unilateral cysts: The relation of this type to the large single cyst, as to causation, cannot be stated definitely. Underlying pathogenic and developmental changes in all these types are the basis of varying theories.

The case to be presented falls into the latter group, namely, that of the multilocular cystic kidney. Judging from the literature, this general group of cases is rather unusual, and, further, there are distinct differences in the individual cases in the group. Two interesting cases were recently reported, one by Schwartz² and one by Lynch and Thompson.³ In the case that I am showing, there is a distinct variation in that there is a complete absence of the ureter, which thereby influences deductions which may be made regarding the pathology and etiology of the condition.

CASE REPORT

The condition occurred in a girl of two years, or, rather, she was that age at the time of operation. Donna H. was admitted to the paediatric service of the Grey Nuns' Hospital, under Dr. U. J. Gareau, on May 4, 1938. She was a well nourished, normal child of two years. There was nothing of importance in the personal or family history. Two older children in the family were well. General physical examination showed circulatory, respiratory, and other systems to be normal. There were no congenital defects and the blood Wassermann test was negative. Blood urea and creatinin were within normal limits, and renal function tests were normal. There were no abnormal findings in the urine at any time.

For some time the child had complained of pain referred down the left side of the abdomen, around the buttock, and down the left leg. The discomfort was not severe. Examination of the abdomen showed a mass, movable on palpation, just below the left costal margin. It felt tense, even firm, and appeared to be about the general bulk of a small orange. The mother states that there was a "lump" noticeable at birth, presumably having been observed by the doctor in attendance, although the mother herself did not notice this until about the fourth or fifth month. The child was examined at one year of age, and our information is that there was a large palpable mass in the left side of the abdomen at that time.

Cystoscopy, under anaesthesia, was carried out on May 7, 1938. A number 16 cystoscope was passed easily. Visualization of the bladder showed the opening of the

* Read at the Seventieth Annual Meeting of the Canadian Medical Association, Section of Urology, Montreal, June 21, 1939.

right ureter normal in position and appearance, but, no left ureteral opening could be found. The general contour and land marks of the bladder appeared normal. Indigo carmine was given intravenously with strong normal excretion and peristalsis from the right side, but no dye was seen to come from the left side of the bladder at any time. The right ureter and kidney were injected with sodium iodide and a film taken. This pyelo-ureterogram was normal.

It seemed evident that there was a non-functioning kidney on the left side, with some type of tumour associated, because of the palpable mass to be felt, as noted above. On May 10th operation was carried out by the lumbar route. As soon as the muscles and fascia were divided, cystic masses appeared in the wound, including the mass which had been palpated previously and which was a tense cyst distended with fluid. Various other large cysts loosely held together by coarse fibrous bands were gradually released and brought to the surface. There were a few strands of fibrous and fatty tissue to be ligated and cut. When the whole mass was delivered there was actually no vascular pedicle or ureter to be seen, although careful search was made. The last tissue attachment of the specimen to the fossa was a thin strand containing a small blood vessel. The wound was closed without drainage and convalescence ensued uneventfully.

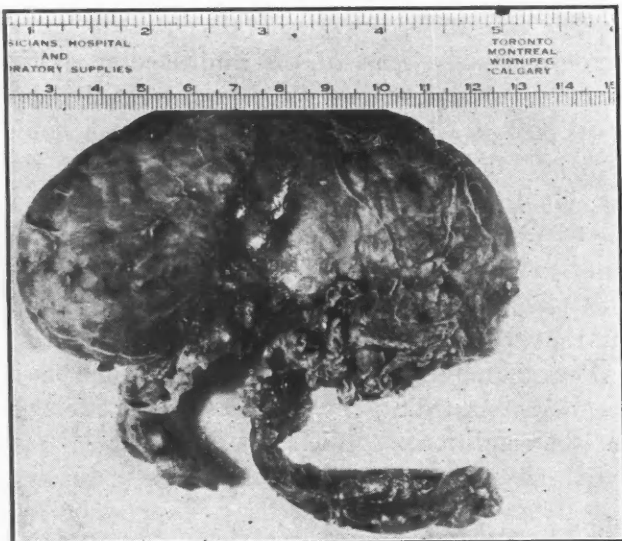


Fig. 1

A photograph of the gross specimen is presented. It is life-size although the actual fresh specimen was greater in bulk than the photograph indicates. It consists of 8 to 10 large intercommunicating locules, and numerous smaller ones ranging from 1 to 3 cm. in diameter. The locules were thin walled and filled with clear fluid. Tiny vessels could be seen in the translucent cyst walls. There was no evidence of a renal pelvis or ureter or of any kidney tissue.

Microscopic.—Sections were taken from various areas in the cystic mass and these show a thin condensed connective-tissue wall. In some regions this wall is lined by a single layer of flattened, cuboidal epithelium, although, for the most part, this lining was absent. In none of the sections was there any recognizable renal tissue.

Etiology and Pathology.—This specimen is from the left renal fossa, and it is interesting to note that congenital anomalies, including instances of complete absence of kidney, are more common on the left side according to the observations of many writers. From the history already cited, it is evident that this condition

must have had its origin extremely early in fetal life to have reached the stage of a noticeable mass at birth. I will endeavour briefly to show that the pathogenesis can be traced to the failure of development of the ureteric bud.

The ureteric bud makes its appearance as an off-shoot from the intermediate portion of the embryonal bladder at the 5 mm. stage (25 days), this latter having been laid down by the fusion of the Wolffian ducts. In normal development the ureteric bud gives rise to the ureter, pelvis, calyces and collecting tubules. This bud grows in a cranial direction to meet the metanephros from which the secreting and tubular structures of the parenchyma are formed. The union of these two fundamental components of the ultimate kidney occurs about the second month of intra-uterine life. When this early union of these two primitive fundamentals is consummated in an orderly and normal way, then nature may be expected to see the culmination of its efforts in the development of a normal kidney, barring, of course, other accidents later on in fetal life. It must be concluded that in the case we are considering the explanation is to be found almost at the beginning of fetal life, and in the failure of the ureteric bud to develop and grow upward to meet its metanephric partner, thus leaving the secretory elements as a series of blind tubules lacking outlet for the products of their activity. Facing this obstruction, generations of tubules underwent cystic changes, finally reaching the proportions of the specimen shown.

I feel some justification in presenting this case because I believe it represents an essentially different phenomenon in maldevelopment from other cases that one has seen reported. The fact that apparently no attempt was made to form a ureter, pelvis, calyces, or collecting tubules, definitely dates the origin of the congenital malformation in this case to the twenty-fifth day of fetal life, or earlier, that is to say, to the time when the primitive elements which later form the ureter, etc., were differentiated from the embryonal bladder and failed to continue growth. If this is conceded it is evident that the various theories concerning the reciprocal effect of anæmia and tubular obstruction as causes of cystic disease could not apply in this instance.

A further question may be considered. Why did the obstructed tubules not undergo complete atrophy in fetal life and give the picture of

renal aplasia rather than cyst formation? In other words, may there not have been some benign neoplastic activity as an etiological factor in this case?

One might be concerned regarding the prognosis for this child, with respect to the remaining kidney. However, basing one's opinion on the concept of unilateral failure of development as outlined herein, it may be assumed with

reasonable certainty that this kidney will not suffer the fate of its unfortunate fellow.

Acknowledgment is made to Dr. Don Moore, Pathologist of the Regina General Hospital, for assistance in the preparation of this case.

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THE TREATMENT OF GONORRHOEA BY CHEMOTHERAPY

(A PRELIMINARY NOTE)

By D. R. MITCHELL, C. H. GREIG AND J. L. UREN

Toronto

THE object of this report is to record the results of the treatment of gonorrhoea by means of chemotherapeutic agents all but one of which are related to sulphanilamide. At the Toronto General Hospital *sulphanilamide* gave about 36 per cent of cures in approximately 500 cases. Although it was felt that a total of 77 per cent were benefited, a general average from the literature credits sulphanilamide with 35 per cent of cures.

Uleron, *septazine*, *promin* (orally) *neo-pronty-sil* have been tried and discontinued because of ineffectiveness or toxicity relative to sulphanilamide.

Dagenan, 3, 4, 4, 3, 3 grams on successive days, cured 87 per cent in two and a half days. There were 252 cases in this series. Toxic manifestations were present in some degree in all patients, but only 2 per cent could not take the drug. One developed hæmaturia at twenty-four hours, but was also cured at the same time. Two developed skin rashes; one developed a so-called "dagenan peritonitis". Dagenan has firmly established itself as the most effective agent developed so far, and has superseded sulphanilamide as the standard of comparison for all new drugs. To supplant dagenan another agent must cure as many as quickly and be less toxic, or else cure an even greater percentage.

Hydroxyethyl cupreine had little or no effect in 10 cases.

Sulfamethylthiazol cured 84 per cent of 65 cases in three days, gave very few toxic upsets, but was discontinued because 1 per cent developed peripheral neuritis. We had no such

case in our series using the abbreviated routine as outlined for dagenan. Under no circumstances was the drug carried beyond the five-day period. Four of six patients resistant to dagenan were cured by sulfamethylthiazol.

From our experience with these two drugs we learned that unless the discharge was gone, or at most only mucoid or serous in character at three days, the drug was likely to fail. If cure had not been established at five days the possibility of cure by these drugs was so small that it could not compensate for the risks attached to prolonging the treatment.

Sulfathiazol.—Fifteen cases (routine as with dagenan). Twelve cases of acute and chronic gonorrhoea were treated; 11 responded and all were free of discharge under three days. Three cases had failed on both dagenan and sulfamethylthiazol. One had failed on dagenan only. Two cases of non-specific urethritis showed an unusually good response, one becoming entirely clear in two to three days. One case of mono-articular arthritis in a patient with a gonorrhoeal history of recent occurrence showed prompt response.

This drug produced headache in two patients and tingling of the fingers in one case. Its use can be prolonged if so desired, although this is probably unnecessary.

The ideal to be hoped for in the treatment of gonorrhoea is that by a drug, 100 per cent effective, relatively non-toxic, injected intravenously on two or three successive days. In this regard *promin* and *solu dagenan* have so far been employed.

Promin.—Seven cases (new 1 and resistant to dagenan 6). All discharge disappeared in every case (5 in twenty-four hours) only to return in two to three days, sometimes while the patients were still receiving the drug on a routine where the drug was given from four to five days. Dosage in successive patients was increased until they were given 48 grams in forty-eight hours in 4,000 c.c. of glucose. Only one showed any toxic effect (cyanosis). Interstitially, the drug caused some irritation, but no sloughing. No effect on the red or white blood cells was noted.

Solu dagenan.—Three cases.

CASE 1

Resistant to dagenan, sulfamethylthiazol, and intravenous promin (36 grams total). Response had occurred with all these drugs, but recurrence followed withdrawal of the drug. Solu dagenan, three grams daily for three days, failed, but six grams daily for three days cured the patient. Now, at two months, there has been no recurrence.

CASE 2

Failure with dagenan, sulfamethylthiazol and promin. Cured with 3 grams of solu dagenan on three consecutive days.

CASE 3

Failed on dagenan, sulfamethylthiazol, promin (48 grams), solu dagenan, 3 grams for three days, solu dagenan 6 grams for three days; cured by sulfathiazol.

The rapid cure of these patients by these drugs is associated with an unusual freedom from non-specific urethritis and other complications so commonly encountered in older forms of treatment. Concurrent local treatment, except for the use of acriflavine, 1/2,000, in totiresistant cases, has been practically discontinued in cases of gonorrhœal urethritis.

For the purposes of this investigation the sulphanilamide, uleron, neo-prontysil, sulfamethylthiazol, and some sulfathiazol were supplied by Winthrop's; the septazine, dagenan and solu dagenan by Poulenc Frères; hydroxyethyl eupreine and promin by Parke, Davis, and some sulfathiazol by Squibb's, to all of whom our thanks are tendered.

BACKACHE: THE RELATION OF PHYSICAL THERAPY TO ITS MANAGEMENT*

BY FRANK H. KRUSEN, M.D.

*Section on Physical Therapy, The Mayo Clinic,
Rochester, Minn., U.S.A.*

THE treatment of backache is one of the most complex and many-sided problems in medicine. Jostes¹⁷ has pointed out that there are few symptoms which offer a greater problem so far as differential diagnosis is concerned. As a subject of multiple aspects, backache is an intriguing therapeutic problem. Meyerding and Pollock²⁵ have said that with the causal factors as numerous as they are varied it is to be expected that treatment will be correspondingly diverse, for just as there is no set cause of backache, so there is no set cure.

Ghormley⁸ has classified the causes of backache under seven main headings: (1) chronic postural strain; (2) trauma; (3) infection; (4) metabolic and senescent conditions; (5) congenital anomalies; (6) neoplastic conditions, and (7) neurological conditions.

CHRONIC POSTURAL STRAIN

Gill⁹ said that, although there are many causes of chronic backache, in by far the largest per-

centage of cases the condition is probably due to muscle and ligamentous strain, either arising acutely from some traumatism or occurring slowly as a result of a chronic strain, such as that due to poor posture. Ghormley likewise stated that chronic and acute strain accounted for a fairly large percentage of the cases of backache. Goldthwait¹⁰ expressed the opinion that 90 per cent of backache is due chiefly to wrong use of the back or faulty bodily mechanics; he said that even in arthritis a strong primary factor is faulty mechanics. Gaenslen⁷ said that postural defects are of primary importance as an etiological factor in the production of backache, and Barker² stated that the most common cause of backache is faulty posture. Bethea,³ in discussing chronic backache, said that faulty posture should certainly be given larger consideration and that in the medical supervision of young people physicians should educate them as to correct posture. Kreuscher¹⁹ said that simple postural deformities are usually acquired during the school age when careless positions at the desks are assumed hour after hour. He said

* Read before the Alberta Division of the Canadian Medical Association, Edmonton, Alberta, September 22, 1939.

that in the early stages these postural deformities are easily corrected, and that parents and physicians do not pay sufficient attention to the posture of growing children. In the presence of prolonged faulty posture a functional decompensation may finally develop. Hauser and Elson¹³ described as the most frequent cause of low back pain a new symptom-complex which they termed "functional decompensation of the back". A primary lesion is absent; the first symptom is "tiredness" in the back and general fatigue. Pain is the most important complaint. There is increase in all the normal curvatures of the back, with sacro-iliac and lumbar tenderness and impaired muscular tone. Sciatica is a common complication. The condition is due to an imbalance between the functional capacity of the back and the demands made upon it. Re-establishment of normal balance gives relief. Increase of reserve capacity to compensate for demands made upon the back may result in cure. Ewerhardt⁶ expressed the opinion that the pain incident to chronic backache is due to strain and overstimulation of muscles and ligaments comprising the hip girdle. The pain is primarily due to incorrect bodily mechanics. Weak muscles *per se* are not the cause, but they allow the condition to occur.

Physical agents, heat, hydrotherapy, massage, splinting, and exercise were thought by Ewerhardt to be the most valuable means of therapy. After a careful diagnostic survey, to rule out other lesions and establish the diagnosis, the routine treatment at the Mayo Clinic for the comparatively small number of patients who have severe chronic postural backache is as follows:^{8, 25} (1) Rest in bed with a fracture board on the springs and a firm hair mattress. (2) Traction of 4 to 8 pounds (1.8 to 3.6 kg.) on each leg. The lesser weights are used at first and more weight is applied as necessary. The hyperextension of the spinal column and the unaccustomed pull on the legs usually increase the patient's discomfort at first. (3) A padded sling under the lumbar region of the spinal column. This, also, may increase discomfort at first, and few patients can tolerate the combination for more than an hour or so at a time for the first one or two days. The patient is therefore allowed out of the apparatus at stated intervals and at meal time. After the first few days patients are able to tolerate the sling and the leg-traction for hours on end. (4) Daily

local applications of radiant heat and deep sedative massage, usually alternating with diathermy and massage. (5) Occasional epidural injections if there is sciatic pain and if relief of pain is not obtained by traction. (6) Finally, manipulation through an extended normal range under general pentothal sodium anaesthesia if previous treatment has failed to elicit a favourable response. We have rarely noted more than temporary relief after manipulation.

If the patient is progressing properly he is finally allowed out of bed. Heat, massage, and very mild exercise are continued. The patient may often be shown how to use these at home. As the pain subsides the exercises are increased. Lower back and general postural exercises designed particularly to develop the erector spinae and gluteal muscles or to restore balance and muscle tone are employed more and more extensively from day to day. Such exercises tend to restore normal function and thus prevent future "functional decompensation" and recurrence.

Although our results with manipulation at the clinic have not been startling, many competent clinicians have employed it enthusiastically, and it possibly merits further consideration on our part. Special exercises and special manipulation (either with or without anaesthesia) have been strongly recommended, particularly in England. Wilson²³ said that a specific type of rhythmical to-and-fro movements, having a rapidity of eight complete movements in each five seconds, are capable of counteracting "habit fixation" in cases of pain in the back. In such cases Lewin²¹ has recommended a special exercise in which the patient fixes the feet under a strap, and sitting on a 14 inch stool bends back to the floor to increase the extensibility of the spinal column. He²² also urged the employment of passive manipulation in cases of postural backache. He quoted Sir Robert Jones as having said, "There is no hidden or mystic rite in the art of bone setting", and concluded that the ability to manipulate is no God-given gift conferred on a chosen few, and that manipulation is indicated chiefly in cases of adhesions, contractures, unreduced dislocations and subluxations. Myers²⁶ has pointed out that manipulation must be followed by adequate physical therapy. He expressed the opinion that the success of the English in the field of manipulation lies in the fact that they closely supervise

and obtain the co-operation of their patients in the days of tenderness following manipulation. Harry Platt, Timbrell Fisher, Mennell, Bankart and Bristow are noted exponents of manipulation. Myers said that it has the appeal to reason, if one assumes that the low back injury is followed by hæmorrhage, synovitis and continued muscle spasm which allows restricting adhesions to develop between either the joints or the fascial planes of the muscles.

Manipulation can do only two things: (1) replace displaced articular surfaces, or (2) break down adhesive obstruction to motion. Manipulation should be followed by rest in bed for one to three weeks and daily applications of heat, massage, and motion (within the limit of comfort). At first a light brace may be needed until muscle tone is restored. As soon as possible a comprehensive course of postural exercises should be started.

Although some writers recommend that such manipulations be done under an anæsthetic, a number recommend that no anæsthetic should be used. Thus Cyriax⁵ reported having manipulated 2,000 backs in twenty years without anæsthesia. Jostes¹⁷ in a carefully prepared article stated that in back conditions which are indeterminate so far as correct allocation of the cause of the pain is concerned manipulation without anæsthesia may be employed. These conditions according to Jostes include anatomical variations, dislocations, fasciitis and myofascial syndromes, and traumatic sprains (acute and chronic). Given a sprain of a deep joint with marked muscular spasm and some degree of deformity, a routine of immediate immobilization and prolonged rest may afford little correction or relief. Rather more logically, Jostes felt that in such cases one would be prone to manipulate the involved joint, gently, in order to correct whatever degree of malalignment or subluxation might have occurred incident to the tearing or stretching of the ligaments or capsule. Gray¹¹ said that "the crux of the matter" lay in a better knowledge of the anatomy of the back than is available in textbooks. His carefully prepared article should be read by anyone who contemplates the employment of manipulation of the back.

Many writers have reported successful results following such manipulations. In 1917 Baer¹ manipulated forcibly 100 patients with beneficial effects. In 1930 Riches²⁸ reported that

manipulation under nitrous oxide-ether anæsthesia was successful in about 90 per cent of 30 cases of chronic back strain and of 25 cases of sacro-iliac strain. Stamm³⁰ reported that the results of manipulation as performed at Guy's Hospital were as follows: of 12 patients with sacro-iliac subluxation, 100 per cent improved; of 19 patients with sacro-iliac sprain, 95 per cent improved; of 27 patients with sacro-iliac strain, 93 per cent improved. In 1937 Troedson³² reported "100 per cent prompt relief" following repeated forcible extension of one or both lower extremities in 9 cases of lumbosacral derangement (which he believed was due to a minute subluxation of one or both of the inferior articular processes of the fifth lumbar vertebra).

Most of the advocates of manipulation recommend various modifications of the following types of movement: (1) forced rotation of the spinal column on the pelvis in each direction; (2) forced flexion of the spinal column; (3) forced extension of the spinal column; (4) rolling of the pelvis with the spinal column flexed; (5) "wheelbarrow manipulation", the prone patient being grasped by the ankles and hyperextended, often with rotation of the pelvis but lowering first one and then the other leg, and (6) forced straight leg-raising with the patient supine (often with rotary movements of the leg).

Despite the fact that it has been said¹⁵ that manipulation has been "far too long neglected" and despite the many favourable reports, there is still little evidence that "adhesions" do exist and there are many good clinicians who question the presence of "subluxations". For example, no less an authority than Willis Campbell⁴ expressed doubt that sacro-iliac separation or relaxation really exists, except in association with severe injuries and, rarely, for a short period in women during pregnancy. In examining many thousands of normal and abnormal backs he never was able to elicit the slightest evidence of sacro-iliac relaxation or separation. Probably the exact sphere of usefulness of manipulation in chronic postural backache will not be settled until these points are further clarified and until additional careful controlled studies are made (comparing manipulation with other conservative methods of treatment). The need for such studies is obvious.

Contracted iliotibial bands.—Consideration of the postural type of backache would not be complete without mention of this condition. Ober has observed that in some cases of low back pain, frequently with sciatica, there was a contraction of the iliotibial band and fascia lata on the affected side. Further, Myers pointed out that it had been noted that in cases in which a fusion operation had been performed on the sacro-iliac joint relief of sciatic pain occurred quickly, even before any fusion had occurred. Percy Roberts²⁹ observed a patient who became free of sciatic pain after a Smith-Petersen incision had been made for exploration of a suspected lesion of the ilium. He performed this operation in 16 other cases and obtained relief from sciatica in all but one. Likewise, in 1934, Heyman¹⁴ reported that relief occurred in several cases in which the fascial attachments to the posterior superior spine of the ilium were stripped off. Ober²⁷ expressed the opinion that fascial contraction might exert muscular pressure on the sciatic nerve through the gluteus maximus and piriformis muscles. Kendall¹⁸ said that the tightness was a contracture of the tensor fasciæ femoris and was the result rather than the cause of the disability. Even though this may be true it is possible that Myers was correct in stating that fasciotomy, as recommended by Ober, is a simple means of breaking a vicious cycle quickly—a contracture which helps to maintain poor bodily posture and a poor posture which allows further contraction of the fascia. After the breaking of the cycle by releasing the contracture by means of an Ober fasciotomy, permanence of cure, however, must rely upon correction of any underlying fault of posture, by physical means, especially a prolonged course of corrective exercises under skilled supervision.

Ober's study of 415 collected cases in which fasciotomy was performed "for lame back and sciatic pain" revealed that 84 (21 per cent) of the patients obtained no relief, 17 (4 per cent) obtained only partial relief, and 314 (75 per cent) obtained complete relief. The average time before relief was obtained was about three months. If such a contracture is suspected, the abduction test described by Ober should be performed. He has clarified his original description of this test as follows. (1) The patient lies on his side on a table, the shoulders and pelvis being perpendicular to the

table. (2) The leg on which he is lying is flexed at the knee, and the hip is flexed and kept flexed, to flatten the lumbar curve. (3) If the patient is on his left side, the examiner, standing behind him, places his left hand over the patient's hip in the region of the trochanter to steady him. (4) The right leg is flexed to a right angle at the knee, and is grasped just below the knee with the examiner's right hand, the leg and ankle being allowed to extend backward under his forearm and elbow. (5) The right thigh is abducted widely and then hyperextended in the abducted position, the lower part of the leg being kept level and care being taken to keep the hip joint in a neutral position as far as rotation is concerned. (6) The examiner slides his right hand backward along the leg until it grasps the ankle lightly, but with enough tension to keep the hip from flexing. (7) The thigh is allowed to drop toward the table in this plane. (Do not bear down on leg.) If the fascia lata and iliotibial band are tight the leg will remain more or less permanently abducted.

It occurred to one of my colleagues, Macey,²³ of the Section of Orthopædic Surgery, that it might be possible to stretch the fascia in such cases by certain forcible passive and active exercises in conjunction with postural exercises. Ober also has recommended stretching exercises. We are now trying this in a few cases but are unable to say as yet whether it will be successful and thus in some instances obviate a painful surgical procedure which has not often been successful at the clinic. Similarly, it occurred to Ilfeld¹⁶ that in such cases it might be possible to obtain at least temporary relief of pain by means of a special form of adhesive strapping applied in such a manner as to relieve strain on the fascia lata, the gluteus maximus muscle and the piriformis muscle. He assumed that there might be muscle spasm which either disturbed the mechanics of the spinal column or irritated the sciatic or gluteal nerves directly. Briefly, his procedure is to have the patient lie on a table on the unaffected side in approximately the same position as that assumed when Ober's abduction test is performed. The patient's knees and thighs are flexed and the legs are held in wide abduction by means of several pillows. With the patient in this position Ilfeld applied three layers of tape. The first row consists of longitudinal strips running

up the lateral aspect of the thigh from a point just above the knee and crossing the pelvic brim and lower part of the back to the opposite side. A second layer of transverse straps is applied over these, and finally a third layer of longitudinal straps is applied over all. When the patient assumes an erect position this strapping is pulled upward in such a manner as to relieve strain on the fascia lata. It would seem that this procedure would give only temporary relief. I have not yet tried it and therefore cannot testify as to its effectiveness.

TRAUMA

Fractures of the vertebræ.—In fractures of the bodies or the processes of the vertebræ correction of alignment and maximal relief is usually obtained following hyperextension of the spinal column with traction and countertraction. A half cast which causes hyperextension of the back may often be employed effectively. Such a cast permits the early employment of heat and gentle sedative massage which may produce relaxation and hasten return to the anatomical normal.

Injury of the intervertebral disks.—This injury has received much attention in the recent literature. The members of the Section on Neurosurgery of the Mayo Clinic have been much interested in this problem. In 1937 Ghormley,¹⁸ of the Section on Orthopædic Surgery, pointed out that pathological changes in the intervertebral disks "may be the most important of all in the cases of chronic lumbosacral strain". He said that the belief had been expressed that "this is a much more common condition than heretofore has been recognized". Recent studies at the clinic tend to confirm this opinion.

The most common traumatic lesion of the intervertebral disks is a herniation or protrusion of the disk into the spinal canal.²⁰ This often causes pressure on a nerve root. Our neurosurgeons have found this to be so common that it must never be lost sight of in cases of intractable sciatic pain. When such a protrusion is present, the Lasègue sign may be positive, Achilles tendon reflexes may be diminished, the sciatic or other nerve roots may be tender, and the concentration of total protein in the cerebrospinal fluid may be increased. The protruded disk may be visualized in the roentgenogram following injection of radiopaque oil into the spinal subarachnoid space. It must be remem-

bered, however, that all these signs may be found in other conditions. The chief symptom which should lead one to suspect this lesion is intermittent root pain, which is often unilateral, sharp and shooting, and usually in the sciatic nerve. It is often described by the patient as feeling "like an electric shock". Characteristically, the pain is aggravated by coughing, jarring, or sneezing. The pain may be precipitated by tension on the involved nerve. Occasionally numbness and weakness are present.

Physical measures are of no avail in the management of this condition. Roentgenological and neurological studies may reveal its presence or absence. Permanent relief can be obtained only by surgical removal of the protruded portion of the disk.

Flexion of the spinal column may cause the protrusion to be drawn back into the intervertebral space, whereas, on the other hand, hyperextension of the spinal column may cause increased protrusion of the disk. This fact may explain the occasionally reported sudden relief or severe aggravation of sciatic pain during the unskilled manipulation by cultists. Any manipulation is dangerous when this lesion is present. Manipulation cannot produce any permanent relief.

INFECTION

Infectious (atrophic) arthritis and spondylitis.—In the treatment of these conditions physical and other conservative measures may be most beneficial. The patient must always use a bed which does not sag. At least twice a day he should discard all pillows and extend all his joints for a half hour. Postural and deep breathing exercises are particularly important, and every effort should be made to combat the tendency toward forward flexion of the spinal column. If fixation becomes inevitable it should occur with the back in the best possible alignment. The daily use of fever therapy for short intervals (thirty minutes) at low bodily temperatures (101° F. or 38.3° C.), either in a tub or a simple fever cabinet, may be most helpful. Such sessions should be followed immediately by deep massage of the back and active or assistive exercises. In some instances a spinal brace may be required.

Sacro-iliac arthritis.—In sacro-iliac arthritis rest, local applications of radiant or other forms of heat, massage, and a good supportive belt or corset will usually suffice to bring relief.

Primary fibrositis.—This is a rather common cause of backache. It rarely is recognized in the United States but is described at great length in the English medical literature. The lesion is a primary infectious chronic inflammation involving the white fibrous tissue of the fascia, aponeurosis, sheaths of muscles and nerves, ligaments, tendons, periosteum, and subcutaneous tissue.

The usual signs are palpable indurations, fibrous thickenings, and nodules in the muscles or fascia, associated with tenderness, swelling and increased tonus of muscle. The patient complains of muscular and periarticular pain and stiffness, particularly morning stiffness and "jelling" (stiffness after a period of inactivity). Fatigue, aching, and chronic lack of energy are the other cardinal symptoms.

Physical therapy as used for this condition includes applications of radiant heat and *very firm* massage directly to the indurations. Stretching exercises are also indicated. While complete relief is rarely achieved with this or any other form of treatment until the condition finally "burns itself out", nevertheless, more than 80 per cent of the patients who continue the use of heat and *firm* massage for many weeks report lessening of the severity and frequency of "flare-ups" of pain and stiffness. Ordinary massage is of little or no value; the massage must be firm and applied directly over the painful indurations. Vaccines, salicylates, and other forms of treatment must be used in conjunction with continued physical treatment, to combat the frequent recurrences.

Tuberculosis of the spinal column.—This condition responds best to rest, fixation, and general supportive treatment. Heliotherapy may be a valuable physical measure in its management. The rather good results obtained by Rollier and others with heliotherapy are so well known that no further discussion is needed here.

Undulant fever.—The bone and joint manifestations of undulant fever (brucellosis) occasionally produce severe backache. Little could be offered, until recently, in the treatment of this condition. Our early studies at the clinic on the use of artificial fever in the treatment of undulant fever have suggested that it may be most effective. In one case in which there was a destructive lesion of the body of a lumbar vertebra fever therapy produced a dramatic

improvement. There has been no recurrence of the pain in the back or other symptoms in more than a year.

METABOLIC AND SENESCENT CONDITIONS

Hypertrophic changes.—Hypertrophic changes along the vertebral column may produce considerable mild pain and discomfort. Heat and massage are generally most beneficial. One condition associated with such changes in the cervical vertebrae is commonly overlooked, and, in my opinion, deserves special mention. This is a radiculitis or segmental neuritis secondary to hypertrophic marginal lipping of the cervical vertebrae with narrowing of one or more intervertebral spaces and also narrowing of the intervertebral foramina. Because of this narrowing there is, apparently, impingement on a nerve root. The physical signs are tenderness and limited motion of the neck, tenderness along the affected nerve and atrophy of the involved muscles. The symptoms are primary pain and stiffness of the neck, which is often relieved by traction and forward flexion, and secondary segmental neuritis such as pain in the shoulder, arm, pectoral or precordial region. Symptoms directly referable to the cervical part of the spinal column may be lacking. Weakness, numbness or tingling of the hands often occur.

Treatment is largely physical. Radiant heat, diathermy, or roentgen therapy, followed by massage and cervical traction, is often beneficial. In the presence of this type of pain one should always consider the use of cervical traction. It may produce dramatic relief of pain. A Sayre's head sling or simple felt head sling may be used to secure traction. A Thomas collar may help to maintain traction. Soft rubber soles and heels will often relieve the patient of discomfort by preventing jarring. Massage of the muscles of the neck and lightly forced rotation of the neck performed according to the technique of Hanflig may be employed during traction. Manual traction and rotation of the neck are sometimes helpful.

Osteoporosis of the vertebrae.—Osteoporosis often occurs in the vertebrae of elderly patients, especially women, and may give rise to considerable backache. Although such patients tolerate spinal braces very poorly it is often imperative that they wear them in order to prevent the occurrence of pathological fracture.

The employment of local applications of heat and massage is especially indicated. Ultra-violet irradiation in conjunction with the oral administration of cod liver oil and calcium is recommended. Although their prolonged use may produce little roentgenological change clinical benefit often occurs.

CONGENITAL ANOMALIES

Spina bifida and sacralization of the fifth lumbar vertebra.—Spina bifida rarely produces symptoms, but partial sacralization of the fifth lumbar vertebra often does. Because there is only partial sacralization repeated minute injuries may occur at the site of contact and produce a traumatic arthritis. Considerable pain may result. Heat and massage may produce symptomatic relief. If complete sacralization occurs trauma does not exist and there is usually no pain.

Alterations in the articular facets.—Alterations in the articular facets of the lumbar vertebrae may cause pain. Postural exercises which will extend the spinal column sufficiently may produce some relief.

Spondylolisthesis.—In most instances spondylolisthesis is probably a congenital anomaly and may be produced by the presence of anomalous facets which permit a vertebra to slide forward. Spondylolisthesis is frequently overlooked, and should be kept in mind when searching for the cause of low back pain. Meyerding²⁴ has described this lesion carefully. It consists of a forward and downward lumbosacral or lumbar vertebral subluxation. It usually follows trauma. The patient often has a groove over the lumbar part of the spinal column, a shortened torso, an abdominal crease and lordosis associated with spasm and prominence of the erector spinae muscles.

The symptoms are pain, stiffness and weakness in the lower part of the back, sacro-iliac region, hips and legs. They are relieved by recumbency. There are no symptoms in 10 per cent of cases.

Meyerding performed spinal fusion in 17 per cent of his cases and it was indicated in a still higher percentage. In other cases combined orthopaedic and physical therapeutic management may be employed. An attempt may be made to reduce the deformity by traction and to prevent recurrence by the application of a cast. A "rocking chair belt" may be used for

support. Heat and sedative massage applied to the back tend to relieve pain and muscle spasm. Although this is probably a congenital defect, when it is mild it should be treated as postural backache. The employment of exercises to decrease pelvic obliquity should be considered.

NEOPLASTIC CONDITIONS

Physical measures other than roentgen therapy play little part in the management of tumours. Tumours (either benign or malignant) should always be kept in mind when the cause of backache is being sought. In hopeless cases of malignancy heat and even light massage as palliative measures may be administered with justification.

NEUROLOGICAL CONDITIONS

Tumours of the spinal cord.—These may be considered in the same category with tumours of the vertebrae as far as the physical therapeutic management is concerned.

Coccygodynia.—This condition may probably best be considered as a neurological condition. Thiele said that painful coccyx was often due to spasm of the levator ani, coccygeus, and pyriformis muscles. In this type of coccygodynia, which is probably much more common than is recognized, there may be tonic spasm and tenderness of these muscles. No acute injury (fracture or dislocation) is found. There may be sciatic and supragluteal tenderness at times, and patients tend to walk stiffly and sit on one buttock.

The symptoms are pain in the coccyx or in the supragluteal region. The pain may or may not extend down the back of the thigh. These symptoms are aggravated when the patient is sitting and are relieved when he lies on his side. There is a vicious cycle—pain and muscle spasm; more pain and more spasm. One may apply radiant heat or diathermy and massage to the lower part of the back, coccygeal region, and gluteus muscles with benefit. This should be followed by a special type of internal massage, performed according to Thiele's technique as follows. Insert the full length of a finger into the rectum with its flexor surface across the levator ani and coccygeus muscles and its tip on the pyriformis muscle. Massage in the direction of the long fibres as a strop is stroked by a razor. Massage lightly at first

and increase the pressure at subsequent treatments.

Thiele reported that repeated daily treatments of this kind were followed by cure or definite improvement in a high percentage of cases.

Hypertrophy of the ligamentum flavum.—Harbin¹² has described sciatic pain caused by hypertrophy of the ligamentum flavum. The lateral edge of this ligament forms the posterior margin of the intervertebral foramen. In rare instances the ligament may become hypertrophied for some unknown reason and cause pressure upon a nerve root. At times the hyperplastic change may become so marked that it encroaches on the spinal canal and compresses the spinal cord. The condition has been reported to be present only in the lumbar region. The symptoms are similar to those produced by slipped disk. Surgical section produces relief. No physical treatment is indicated.

Psychogenic backache.—This condition may be very real to the patient. It has been said²⁵ that the complaint of backache made by a young married woman may, on analysis, be found to arise from sexual incompatibility or from fear of pregnancy. In such instances, the symptom

is a defense mechanism built up often unconsciously. Until the psychological background is explained physical or other treatment will be largely ineffective. Such patients are constitutionally inadequate persons who shrink from responsibility "by hiding behind the bulwark of a functional complaint." If physical measures are employed to promote the general well-being of such patients in conjunction with proper psychotherapy confidence may return and the pain may disappear.

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NOTE.—A summary and fuller list of references may be found in the reprints of this article which can be obtained from the author. Most of the reference numbers in the text relate to this larger list.

HÆMORRHAGIC TENDENCY ASSOCIATED WITH PROTHROMBIN DEFICIENCY AND ITS TREATMENT WITH VITAMIN K AND BILE*

BY STUART R. TOWNSEND AND EDWARD S. MILLS

Montreal

THIS paper presents further studies on the hæmorrhagic tendency associated with prothrombin deficiency and its treatment by means of vitamin K and bile.¹ The cases under consideration are those which presented in the medical and surgical wards of the Montreal General Hospital during 1938 and 1939.

METHODS

In our early studies the prothrombin and coagulation times were calculated by the methods of Howell, and Lee and White,[†] as outlined in most standard textbooks. In subsequent cases the prothrombin or clotting time was studied by Quick's method,² which was found to be more suitable. Determination of the

prothrombin time has replaced efforts to estimate prothrombin in the blood by a direct method, since the calculation of the prothrombin time is relatively simple and its variations have been proved to be quantitatively comparable to those which occur in the plasma prothrombin.

For those unfamiliar with the technical methods involved, the prothrombin or clotting time (Quick), is the number of seconds required for decalcified blood to clot after the addition of an optimal amount of calcium, and an active preparation of thromboplastin. In other words, if calcium and thromboplastin are kept constant, the rate of thrombin formation becomes proportional to the concentration of prothrombin, and the prothrombin time an indirect measurement of the plasma-prothrombin level, which Snell³ has pointed out varies inversely as the clotting time.

The vitamin K was a preparation made from alfalfa and was used in both capsule and liquid form. A few cases have been tried on synthetic K substitutes.

CASES NOT TREATED WITH VITAMIN K AND BILE

This group comprises 6 cases of stone in the common duct, 4 cases of carcinoma of the

* From the Department of Hæmatology, Montreal General Hospital, Montreal.

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† The coagulation times were studied by the method of Lee and White and not by the method of Duke, as erroneously stated in a previous paper.¹

pancreas, 3 cases of cholelithiasis, 2 cases of catarrhal jaundice, 1 case of cholecystitis and 2 cases of malignant growth in the biliary tract.

Nine of these cases were treated surgically. The remainder, for various reasons, received only symptomatic treatment. The cases which showed abnormal hæmorrhage were as follows, (1) a 47-year old male (No. 3399-38) jaundiced for 2 months as a result of carcinoma of the pancreas. On admission the van den Bergh was 12 units, the prothrombin time (Howell) 260 seconds and the coagulation time (Lee and White) 38 minutes. Cholecystgastrostomy was performed. The patient died of post-operative hæmorrhage on the third day and at necropsy the stomach was found filled with blood clot. (2) A 63-year old male (No. 4406-38) with jaundice of 10 days' duration due to carcinoma of the pancreas had a pre-operative prothrombin time of 140 seconds (Howell) and coagulation time of 18 minutes. The van den Bergh was 17 units. The patient died on the first day after cholecystgastrostomy from massive hæmorrhages into the bowel and peripelvic renal tissue. (3) A 50-year old male No. 2288-39 with jaundice of 5 days' duration due to carcinoma of the bile ducts had a prothrombin time of 37 seconds (Quick). No operation was performed. Death resulted from hæmorrhage from the tumour area into the gall bladder and intestine.

This incidence of hæmorrhage is in distinct contrast to that in the "treated" group in which no deaths from abnormal bleeding occurred.

Chart 1 shows all the cases in this group. Those which had hæmorrhage are also indicated in the chart. It will be observed that three of the four cases with prolonged prothrombin times bled abnormally. In one of the cases the hæmorrhage would seem to have resulted from vascular changes inherent in the tumour rather than to changes in the coagulability of the blood. The fourth patient died from bronchopneumonia and had no operative manipulation.

Although no changes in the prothrombin time occurred in the remainder of the untreated cases, yet it must be recognized that bleeding may occur where there is sufficient blood loss at operation to lower the prothrombin to a critical level below which important hæmorrhage may take place. This will be discussed later when the results of the treated cases are considered.

In this group of cases as illustrated in Charts 4 and 5, the degree of jaundice bore no re-

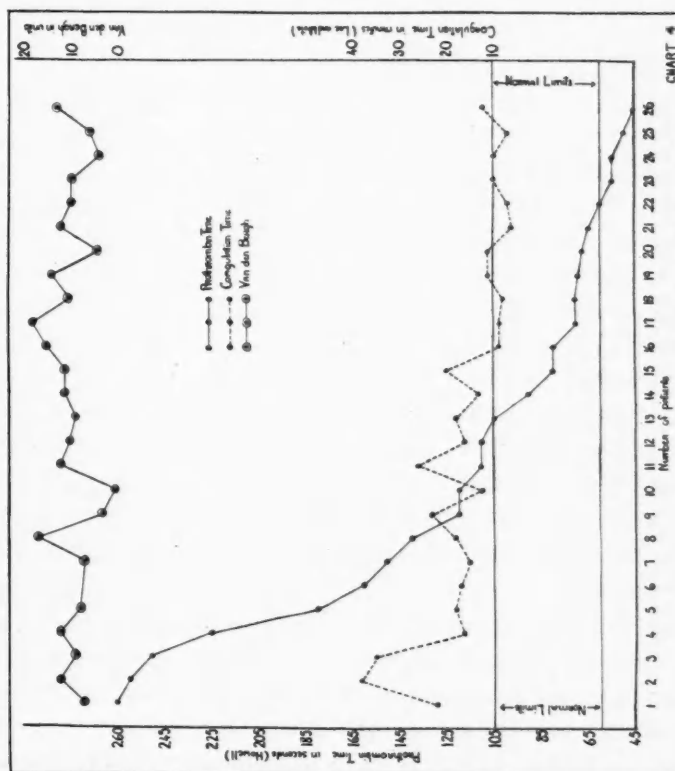
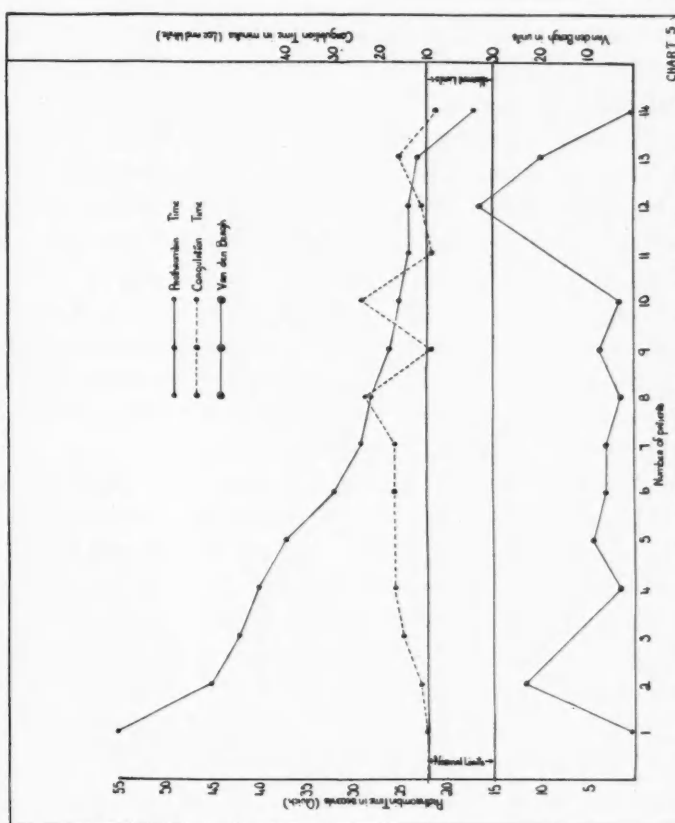
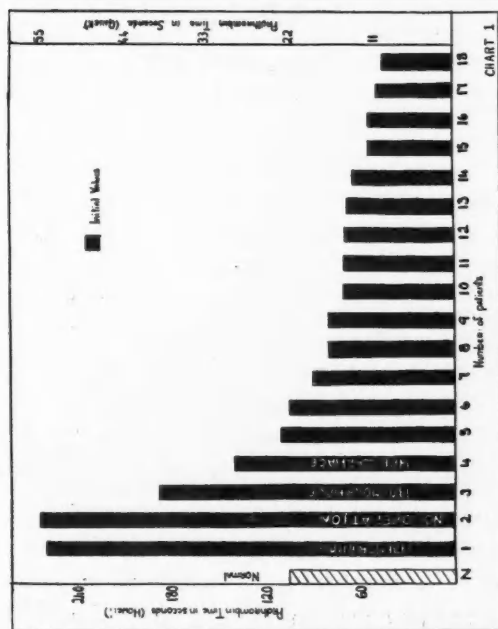
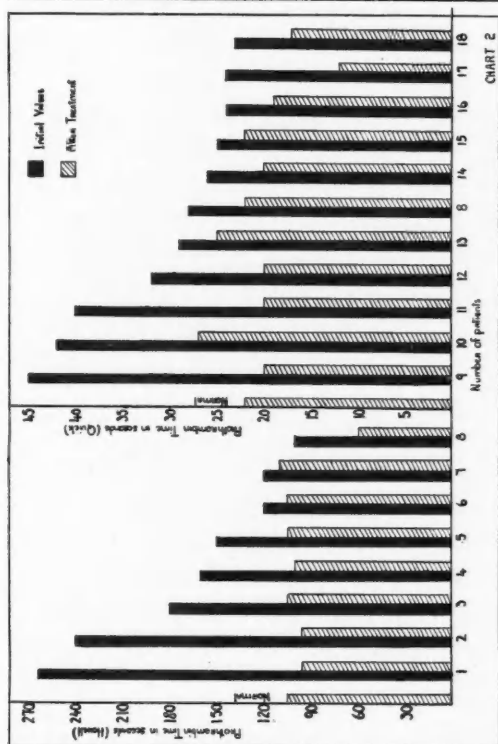
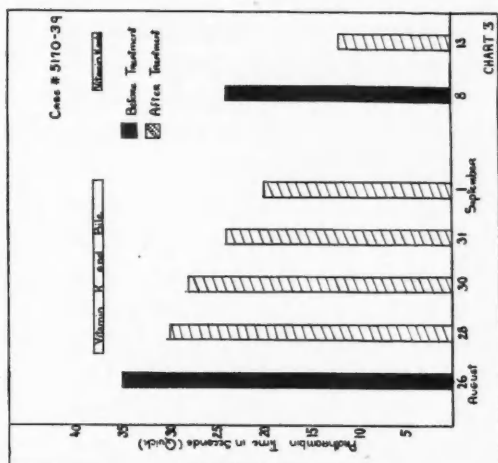
lationship to the prothrombin times, nor did the duration of the jaundice directly influence the clotting time. From a theoretical standpoint it may be said that the more complete the obstruction and the longer it exists, the greater will be the tendency to disturbance in the prothrombin level. The apparent lack of relationship between the theoretical considerations and the practical observations in this series of cases may be due to the fact that many of the cases showed periods of incomplete obstruction during which the jaundice lessened. When the degree of bilirubinæmia is compared with the apparent duration of the jaundice this point becomes evident.

CASES TREATED WITH VITAMIN K AND BILE

Seventeen were treated with vitamin K and bile and the remaining 3 with synthetic vitamin K substitutes. In this group there were no cases of fatal hæmorrhage, although three exhibited a hæmorrhagic tendency, with disturbance in the prothrombin time before treatment.

The cases in this group included 7 cases of cholelithiasis, 5 of common duct stone, 3 of carcinoma of the pancreas, and in the remainder the jaundice was a result of biliary tract disease. Three of the 20 cases bled post-operatively. In one case (No. 1975-39) the pre-operative prothrombin time was normal, but following cholecystectomy bleeding occurred and blood transfusions failed to control the hæmorrhage. Vitamin K and bile therapy resulted in a prompt beneficial effect. It is possible that in this case sufficient bleeding took place at the time of operation to reduce the prothrombin level to a critical point below which hæmorrhage occurred, inasmuch as a definite disturbance of the prothrombin time was noted after operation and before treatment. The second case (No. 2494-39), one of internal biliary fistula, was operated on without a previous prothrombin determination. Bleeding after operation was controlled by vitamin K and bile therapy. The third case (No. 2244-39) was one of cholelithiasis in which a pre-operative prothrombin time was not determined. Cholecystectomy was performed, with drainage of the common duct (drainage was copious). Bleeding occurred and the prothrombin time was found to be disturbed. Vitamin K and bile therapy controlled the hæmorrhage.

None of the patients bled before operation. It is worthy of note that many of the disturbances in prothrombin time were considerably pro-



response to vitamin K alone. Chart 4.—For purposes of comparison the prothrombin times in seconds (Howell) have been plotted from high to low with corresponding coagulation times and degree of bilirubinemia. Chart 5.—For purposes of comparison the prothrombin times in seconds (Quick) have been plotted from high to low with corresponding coagulation times and degree of bilirubinemia.

Chart 1.—Prothrombin time (in seconds) of 18 cases of jaundice receiving no vitamin K and bile therapy. Three cases of fatal hemorrhage. Chart 2.—Prothrombin time in seconds of cases before operation and the response to vitamin K-bile therapy. There were no cases of hemorrhage after treatment. Chart 3. (Case No. 5170-39).—Response to vitamin K-bile therapy. Return of disturbance after discontinuing treatment. Second

longed, but were restored to normal with adequate treatment. In general we have found that the oral administration of 3,000 units (approximately 90,000 Dam units) of vitamin K per day with 2 to 3 g. of desiccated whole fresh bile is sufficient to reduce the prothrombin time to normal in three days. Smaller dosage, while producing a favourable effect, required a longer period of time, and, conversely, larger dosage, a shorter interval to produce a comparable result.

Charts 4 and 5 also illustrate the lack of relationship between the degree of jaundice and the prothrombin times. In neither do the changes in the coagulation time indicate that it is a sufficiently reliable test to replace the more accurate method of Quick. The method of Howell was found to be a reliable test for the determination of prothrombin deficiency states, although in our hands, it did not prove as reliable as the Quick method. Nevertheless, the method of Howell is a useful test and has the advantage of being more adaptable to the average laboratory where thromboplastin in some form, such as desiccated rabbit brain, is not readily available.

TREATMENT

The therapeutic value of vitamin K and bile has been definitely established in this and other clinics. It must be emphasized that the presence of bile is necessary for absorption of this vitamin when bile is excluded from the gastrointestinal tract, either as a result of biliary obstruction or fistula. The amount of bile which drains from the wound should be carefully determined, and if the amount is excessive obstruction of the T-tube or the common duct should be suspected. If this is done needless and serious hæmorrhage may be avoided.

As already stated we have found that 90,000 Dam units of vitamin K per day with 2 to 3 g. of bile are adequate in the average case. When more rapid action is required larger doses up to 300,000 (Dam) units or more may be used with prompt effect. In Charts 1 and 2 the prothrombin levels are shown graphically, and in the latter the response to vitamin K-bile therapy is depicted.

The isolation of vitamin K in pure form promises to render therapy more effective because it may be given parenterally or by mouth. The purification of K in crystalline form was accomplished by McKee *et al.*⁴ Studies in regard

to the chemical nature of the substance indicated that it was related to substituted 1, 4-naphthoquinones. One of these, phthiocol or 2-methyl-3-hydroxy-1, 4-naphthoquinone, was shown to have antihæmorrhagic activity.⁵ This was confirmed by several authors,^{6, 7} but the prothrombin time did not return to normal in every case where it had been used. Experiments with simpler naphthoquinones revealed that they also possessed anti-hæmorrhagic properties. Of other compounds used in chick assay,^{8, 9, 10} some have been found to be more active than phthiocol. It is believed that 2-methyl-3-phytyl-1, 4-naphthoquinone is the same as crystalline vitamin K derived from alfalfa.¹¹ From laboratory experiments it would seem that 2-methyl-1, 4-naphthoquinone is the most potent of the synthetic preparations so far assayed,^{10, 12, 13, 14, 15, 16} and this has received some clinical confirmation.^{17, 18} Toxicity has not been a feature in any of the clinical cases but in animals large dosage has produced a hæmolytic anæmia.¹⁹

Three of our cases of obstructive jaundice in the "treated" group received synthetic vitamin K substitutes. In one case with carcinoma of the pancreas and obstructive jaundice (No. 7914-39), 2 mg. of 2-methyl-1, 4-naphthoquinone along with 3 g. of desiccated whole fresh bile per day were used. The prothrombin time which was 45 seconds (Quick) before treatment was reduced to a normal level of 20 seconds in three days. Laparotomy was performed with no post-operative bleeding. The second patient (No. 5886-39) who had carcinoma of the transverse colon and obstruction of the common duct by metastases responded well to the parenteral administration of 1 mg. (in 1 c.c. of corn oil) of 2-methyl-3-phytyl-1, 4-naphthoquinone daily, but the period of time required for a fairly satisfactory response was 8 days. No bile was used, as it was not considered necessary for absorption. We have no data on the possible catalytic effect of bile but such an effect might possibly exist. The third case (No. 5767-39), with stone in the common duct, responded well to 1 mg. of 2-methyl-1, 4-naphthoquinone by mouth daily for four days. Two grams of bile were given in conjunction with the synthetic K.

Further experiences with synthetic vitamin K preparations are being investigated as cases of obstructive jaundice present themselves. The above data are too scanty to permit lengthy conclusions but indications are that these substances

may prove more potent than the original vitamin K preparations from alfalfa, and that this new therapy will replace the early type of treatment. In addition, the parenteral administration has obvious advantages over the vitamin K by mouth.

In the three cases quoted above there were no local reactions or toxic effects. Blood studies revealed no evidence of a hæmolytic anæmia, but in view of the animal experiments this complication should be kept in mind until more is known of the action of these substances in the human.

CASES WITH GASTRO-INTESTINAL LESIONS WITHOUT JAUNDICE

Reports have been made of prothrombin deficiencies in cases with gastro-intestinal conditions not associated with obstructive jaundice.^{20, 21} In our studies we have encountered five cases with lesions of the gastro-intestinal tract and disturbed prothrombin times.

This group includes one case of carcinoma of the stomach and one case of peptic ulcer with hæmorrhage in which prophylactic treatment with vitamin K and bile was successful in avoiding post-operative hæmorrhage. A third case with permanent colostomy and subsequent abscess formation revealed a slight disturbance of the prothrombin time before incision of the abscess. Vitamin K, but no bile, was given, and following incision of the abscess bleeding occurred. A prothrombin time showed a further disturbance in the prothrombin, the clotting time being 35 seconds. There was no jaundice in this case and presumably a good liver function. We are not certain whether to attribute the negative response to a failure of vitamin K or to the fact that bile was not given. A fourth case, one of ulcerative colitis, did not show a disturbance in the prothrombin time, but in the course of 6 months, during which the symptoms persisted, the prothrombin time became slightly disturbed. The response to 2 mg. of 2-methyl-1, 4-naphthoquinone intramuscularly reduced the prothrombin to normal. There was no operative manipulation. The fifth case was one of peptic ulcer in which a partial gastrectomy was done to alleviate stenosis. Prior to hospitalization the dietary intake had been poor owing to persistent vomiting. Frequent gastric lavage and low food intake may have contributed to the tendency to post-operative hæmorrhage which could not be controlled with frequent blood

transfusions. A prothrombin time showed a disturbance of 35 seconds after which 250,000 units (Dam) of vitamin K and 2 g. of bile were given by duodenal tube. Following this therapy the prothrombin time was restored to normal, with control of the hæmorrhage.

These cases confirm previous reports^{20, 21} that in intestinal conditions where food intake is diminished, where there is diarrhœa, where artificial bowel openings are made for intestinal obstruction, or in other conditions where absorption surfaces are decreased, the prothrombin levels may be disturbed and be a potential cause of abnormal post-operative bleeding. It is recognized that combinations of these factors may exist, such as in ulcerative colitis or sprue.

CASES WITHOUT JAUNDICE OR GASTRO-INTESTINAL LESIONS

During the past two years routine prothrombin times have been done on about 1,000 pre-operative cases. In this period of time cases have been encountered showing a disturbance in the prothrombin time not associated with jaundice or gastro-intestinal lesions.

These include one case of chronic maxillary sinusitis treated pre- and post-operatively with transfused blood and in two cases of tonsillitis the operation was deferred because of disturbed prothrombin times; one of the latter cases showed a profound disturbance in the prothrombin time (85 seconds). The prothrombin time remained disturbed over a period of months, and eventually returned to normal with subsidence of the infection. Two cases of adenoma of the prostate, one case of tonsillitis associated with epistaxis, and one case with an infected hand, all showed prothrombin time disturbances. Three of these cases were treated with vitamin K and bile with a return of the prothrombin time to normal and without abnormal post-operative bleeding. The case with the infected hand showing a prothrombin time of 50 seconds was not treated with vitamin K and bile. Post-operative bleeding occurred and required secondary suture for its control.

An additional case (No. 5170-39) admitted to hospital for investigation revealed no organic disease, but the prothrombin time was found to be disturbed before the extraction of the diseased teeth (Chart 3). Vitamin K and bile therapy reduced the prothrombin time to normal. Withdrawal of the therapy for a period again resulted

in a prothrombin time disturbance, and this was again reduced to normal with vitamin K alone.

It is difficult to explain why the prothrombin time is disturbed in these cases and there is no adequate theoretical explanation on the basis of our present knowledge. Nevertheless, we cannot ignore the fact that disturbed times were found which responded to vitamin K-bile therapy, and in one case to vitamin K alone. The case illustrated in Chart 3 is fairly conclusive evidence that the above details are not the result of technical error. The common denominator in all these cases is infection, but whether this is the factor which gives rise to prothrombin time disturbances in certain individuals will have to await confirmation.

SUMMARY

Further studies are presented on prothrombin deficiency and its treatment with vitamin K and bile. In a control series of 18 untreated cases with jaundice there were 3 deaths from hæmorrhage. In 17 comparable cases treated before operation with vitamin K and bile or by synthetic K substitutes there were no fatal hæmorrhages.

Contrary to expectation, no definite relationship was found between the degree of disturbance of the prothrombin time and the duration or intensity of the jaundice. This was considered to be due to the fact that many of the cases did not show complete obstruction as indicated by the low values of the plasma bilirubin.

Cases were treated effectively by both the oral and parenteral methods. The latter has the advantages of being effective without bile, and is uninfluenced by factors affecting absorption from the gastro-intestinal tract.

The oral administration of approximately 90,000 Dam units of vitamin K per day with 2 to 3 g. of bile is sufficient to reduce the prothrombin time to normal in three days in the average case. One to 2 mg. of the synthetic vitamin K substitutes per day have proved to be an effective average dose.

Treatment has also been found equally effective in other conditions associated with prothrombin deficiency, such as gastro-intestinal lesions without jaundice, and in cases where infection seems to be the only factor present.

The vitamin K and the synthetic vitamin K substitutes used in these studies were furnished through the kindness of Messrs. Ayerst, McKenna & Harrison, Limited, and E. R. Squibb & Sons, the desiccated whole fresh bile through the kindness of Parke, Davis & Company.

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THE RELATIVE MERITS OF INTRAVENOUS AND RETROGRADE UROGRAMS*

BY GORDON S. FOULDS AND E. H. SHANNON

Toronto

TEN years have passed since intravenous urography was introduced into urological and radiological practice. Basing our opinions on experience with the method during these ten years, we have endeavoured to assess its value and to compare the accuracy of the information afforded by it with that which has been obtainable by cystoscopy and retrograde pyelography.

The information to be obtained from intravenous urograms may be adequate for the establishment of a correct diagnosis, totally inadequate for any accurate interpretation, or quite misleading. The accuracy of their portrayal of the structure and functional condition of the urinary tract depends upon the suitability of the radiological technique employed and the physiological adequacy of the kidney. The satisfactory interpretation of the conditions portrayed requires both skill and experience in urological radiology.

In general, excretory urography is found to be of most advantage in those cases in which the avoidance of cystoscopic examination is desirable, or its performance impossible, assuming of course that the kidney function is sufficiently good for its proper execution. In the examination of children, of the very aged or emaciated it is of particular value.

Where both methods of pyelography are available the intravenous route is frequently selected for the localization of shadows of calcareous quality with respect to the kidneys and ureters. Such shadows are encountered most frequently in the right upper quadrant, and in that position are commonly due to gall stones. Usually the differential diagnosis in such cases can be effected without difficulty, due to the characteristic appearance and distribution possessed by biliary calculi. At times the possible relationship of such calculi to the gall-bladder may be established by the administration of iodeikon. Often, particularly if the gall-bladder function is poor, recourse must

be had to pyelography, the intravenous method being preferable in such cases, as it avoids unnecessary instrumentation. Stereoscopic films are made after administration of the medium intravenously, and will usually establish the relationship of such calculi to the ureter or kidney unless a reflex anuria has been set up. A calculus impacted in the ureter may be identified and the effect of the stone on the ureter and kidney above may be determined in some cases in which such knowledge could not be otherwise obtained. Calcification in vessel walls, tuberculous glands with calcium deposition, and phleboliths may similarly be differentiated from intrinsic calcifications or calculi. In renal tuberculosis the identification of calcium deposits in the renal parenchyma may establish the nature of the lesion with a high degree of accuracy, though frequently for study of the finer structural changes retrograde pyelography must be ultimately employed.

We have found that renal anomalies, unless associated with markedly impaired function, can be recognized with greater ease by excretory urography, particularly when the anomaly involves a ureter with abnormal insertion or when duplication is present, complete or partial. When examined by the retrograde method one ureteral orifice may be overlooked when duplication is complete, or when it is incomplete the ureteral catheter enters only one division, and so the anomaly will not be discovered unless the abnormality of the internal structure of the kidney is recognized. Besides being of value in locating ectopic or extravascular ureteral orifices the intravenous method of pyelography may be used for the study of the upper urinary tract in cases in which the ureters have been transplanted to the bowel.

Intravenous urography may be used to portray the motility of the renal pelves and ureters free from mechanical interference by ureteral catheters. The filling of the tract is accomplished chiefly when its components are in a state of relaxation or diastole. Those parts which are contracted or which are in systole are not filled with the solution and so cannot be

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seen. An estimate is therefore possible of the dynamics of the urinary tract, which we now know to be constantly in a state of change due to peristalsis. The ureters, once regarded as inert tubes, are known to be constantly in a state of change due to peristaltic activity. Alteration from the normal in such peristaltic movement can be detected radiologically in serial films and any localized segments not exhibiting such normal movements can be identified. Areas of absent peristalsis may be due to adhesions binding down the ureter from without or to fibrous tissue formation in the ureteral wall.

Cases of hydro-ureter are satisfactorily demonstrated by excretory urography. Where drainage is impaired by ureteral stricture the condition of the ureter proximal to the stenosis, which may not permit the passage of a catheter, may be readily determined. In hydronephrosis the earliest structural changes are demonstrated less well than by the retrograde route. The same is true of the earliest changes produced by inflammation. Well-marked hydronephrosis can be recognized with ease and an estimate of the degree of dilatation be made with sufficient accuracy to permit the selection of proper treatment.

Inasmuch as intravenous urography depends upon adequate excretion of the pyelographic medium, satisfactory outline of the urinary tract cannot be expected in those pathological conditions in which renal function is grossly diminished. The method cannot be relied upon for this reason in the detection of polycystic disease. In many instances, even without marked impairment of function, the pelves and calyces are not sufficiently well-filled to permit accurate study of the finer detail of their outline. When such detail of outline is lacking excretory urograms cannot be depended upon for the determination of the source of the blood or pus where hæmaturia or pyuria has been a symptom.

Where renal tuberculosis is suspected two problems present themselves immediately, the demonstration of the tuberculous process in the affected kidney, and the demonstration of the absence of the disease in the contra-lateral one. The more extensive changes may be detected by excretory pyelograms, but where the disease is early and the variation from normal slight they are insufficient and retrograde urography is

essential. In addition, the data obtained by cystoscopy and ureteral catheterization are invaluable in making a correct diagnosis. We do not consider that the intravenous method provides sufficient information for the detection of early tuberculosis in the kidney or for the demonstration of its absence in the opposite kidney.

Renal neoplasms may be difficult to demonstrate by pyelography when they are small, or when they are situated away from the renal pelvis. It is our experience that the intravenous method cannot be relied upon in the diagnosis of such tumours in their early stages or where they do not cause extensive alteration in the pelvic outline. On the contrary, poor filling of the pelvis may give rise to bizarre pelvic shadows which simulate the deformity commonly seen with neoplasms. On more than one occasion we have been called upon to investigate cystoscopically patients in whom a diagnosis of renal tumour had been made by intravenous urograms where retrograde pyelograms demonstrated a normal pelvic outline. We have found, however, that a clear, well-filled urogram showing a normally outlined renal pelvis may be of use in demonstrating that an abdominal mass is of extra-renal origin.

The excretion of the pyelographic media in good concentration has been accepted as satisfactory evidence of adequate renal function. We believe, however, that other factors similar to those utilized in interpreting the phenolsulphonphthalein test should be taken into consideration. In this way the early appearance of the dye in satisfactory concentration with a normal pelvic outline may be interpreted without question as being an evidence of good renal function, whereas the excellent delineation of the kidney pelvis after a delay of 30 minutes in the presence of partial obstruction to the urinary flow is definitely subject to question as evidence of satisfactory renal function. On the contrary, lack of secretion of the opaque substance is too often interpreted as being due to complete absence of function in the kidney. Several causes for the failure to obtain a pyelographic shadow may be noted in addition to the total absence of function. There may be a temporary lack of excretion due to a reflex inhibition of secretion by a sudden occlusion of the ureter by a stone or a clot. Toxic changes in the kidney may bring about a similar absence of the medium in

the kidney pelvis. There are also instances in which hypermotility of the kidney pelvis and ureter may cause the opaque medium to reach the bladder quickly and so give no evidence of filling of one kidney and ureter. There remains an occasional patient in whom bilateral absence of secretion of the dye is temporarily noted. An example was a patient who one year previously had had satisfactory visualization of the urinary tract by intravenous urograms from which diagnosis of bilateral nephroptosis had been made. Recently further urograms were made, but in these films no shadow appeared in over 30 minutes, though the renal function tests had been normal. Two days later further films were made, using the same preparation from the same batch. Satisfactory urograms were again obtained. We are unable to explain such an occurrence. Before it can be assumed that a kidney is functionless on the ground that it has not been visualized in intravenous urograms, cystoscopy and retrograde pyelograms should be made. In a large proportion of cases checked in this manner satisfactory function will be demonstrated in the suspected kidney.

After ten years' experience with intravenous urography we look upon it as a most useful adjunct in urological practice. Even though it may not afford sufficient data for an accurate diagnosis, when considered with other clinical findings it may be of great assistance where retrograde pyelography is impossible or inadvisable.

In some conditions, such as hydronephrosis and certain renal and ureteral anomalies, and

in the identification of renal and ureteral calculi intravenous urograms may make possible a sufficiently accurate diagnosis that surgical treatment may be decided upon without resort to cystoscopic methods. On the contrary, complete urological examination including ureteral catheterization and pyelograms is almost invariably required for the accurate diagnosis of renal tumours and renal infections, particularly tuberculosis. No case of pyuria or hæmaturia should be considered to be completely investigated unless the examination includes cystoscopy.

In many instances misleading information is yielded by excretory urograms. This, coupled with lack of experience in their interpretation, may lead to dangerous conclusions being reached. The erroneous diagnosis of renal tuberculosis or neoplasm, or of a functionless kidney, with the advice that it should be removed is an example of this danger.

However, the use of the excretory method by physicians and surgeons in the investigation of vague urological or abdominal symptoms has led to the earlier discovery of many relatively silent renal calculi, hydronephroses, and renal anomalies which otherwise would not have been referred for urological investigation until later well-marked symptoms had developed.

If the shortcomings and limitations of intravenous pyelography are fully realized, and care taken in the interpretation of the information afforded by these urograms, the method stands out as one of the more important recent additions to urological and radiological practice.

In the German Ephemerides the case of a person is described who had taken so much Elixir of Vitriol that his keys were rusted in his pocket by the transudation of the acid through his skin, and another patient is said to have taken Argentum Nitratum in solution until he became blue. But all these philosophers, doctors, and divines sink into insignificance before Samuel Jessop, who died at the age of 65 in 1817, whose inordinate craving for physic led him to take in 21 years no less than 226,934 pills besides 40,000 bottles of mixture; and in the year 1814, when his appetite increased, his consumption of pills was 51,590!!! Truly he must have thought with the prophet, "The Lord hath created medicines out of the earth, and he that is wise will not

abhor them." (Eccles. XXXVIII, 5, 6).—William Wadd, *Mems. Maxims and Memoirs*, Lond., 1827.

In Southwark Cathedral, London, is a fine mural tablet to the memory of Lionel Lockyer who was noted in his time for his pills. They must have been marvelously efficacious for they made him immortal, if we are to believe his epitaph, which runs as follows:

His Virtues and his Pills are so well known,
That envy can't confine them under stone:
But they'll survive his dust and not expire,
Till all things else at th' universal fire.
This verse is lost; his Pills embalm him safe
To future times, without an Epitaph.

THE EFFECT OF REDUCING DIETS ON THE EYE

(A PUBLIC HEALTH PROBLEM)

BY WILLIAM THAU, M.D.

Boston, Mass., U.S.A.

DESPITE many warnings which have hitherto appeared in the literature against the dangers to the public health, and particularly to the eye, as a result of an inadequate diet, unscientific medication, and the indiscriminate use of any means to diminish weight, one still sees people showing symptoms or signs of self-inflicted disturbances and of vitamin deficiencies produced by ignorance or ill advice.

Several cases with such symptoms seen recently have prompted our calling attention to their rather frequent occurrence and to the fact that they can be easily prevented by educating the people to consult their physician before and while using any method to lose weight. The following five cases and a brief review of the literature on the subject will serve as an illustration of the importance not only of an adequate diet but also of the influence of a normal balance between hormones and vitamins on public health in general and on the eye in particular.

CASE 1

On March 7, 1939, S.P., a white American housewife, 56 years old, complained of a whitish yellowish spot on her left eye. She had gone on a reducing diet for the previous 6 months and had lost 25 pounds. The examination revealed a typical xerophthalmia of both eyes (more marked in the left). The treatment consisted of a balanced diet plus capsules containing all the vitamins, and, in addition, rubbing the hands with 1 teaspoonful of cod liver oil before going to bed, and locally atropine 1 per cent and yellow oxide of mercury 3 per cent b.i.d. This xerophthalmia disappeared after three weeks.

This case is a classic example of typical xerophthalmia (third stage), much of which was seen during the last war in Germany, and in the neighbouring countries where margarine and other substitutes were used instead of butter, milk, and milk products.

CASE 2

On March 10, 1939, T.C., a 39-year old business man, complained of a grayish spot on his left eye. The examination revealed xerophthalmia of both eyes and liver disturbances. He was likewise treated with a balanced diet and vitamins, plus local treatment consisting of yellow oxide of Hg., 3 per cent, and atropine 1 per cent. He was cured in two weeks and urged to continue the intake of vitamins permanently.

This case illustrates a typical xerophthalmia caused by the depletion of vitamin A as a result of liver insufficiency. The depletion of vitamin A was brought about by the inability of the liver to store vitamin A on the one hand, and the inadequate intake of vitamin A on the other.

CASE 3

On March 14, 1939, P.L., a 34-year old single bank teller, complained of a reddish bluish spot in her right eye. She was "overweight" and had been taking thyroid for the previous several weeks. Here the right eye showed a large phlyctenula about 6 mm. in diameter, with a crater in the centre, located in the external bulbar conjunctiva. She was treated like the previous two cases, and cured in three weeks.

It is obvious that this phlyctenula was caused by diminished resistance as a result of the restricted diet and of the vitamin A deficiency aggravated by the lack of supervision during the intake of thyroid which precipitated the depletion of vitamin A.²

CASE 4

On April 10, 1939, L.N., a 68 year old housewife, complained of being extremely tired and suspecting ocular defects. She was on a reducing diet and taking iodine for her thyroid trouble. Examination revealed a vitamin B deficiency, and the treatment consisted of a balanced diet and yeast (3 times daily), in addition to the prescribed glasses.

This case has been followed for 12 weeks, and there is no doubt that it is another example of a plain vitamin B deficiency.* Indeed, it is easy to overlook a vitamin deficiency unless it is obvious and presents a well advanced symptom like xerophthalmia. In general, only organic lesions or mental disturbances are looked for and treated.

CASE 5

On May 6, 1939, L.J., a white 30 year old single hostess, came with a complaint that her eyes were frequently "blood-shot". She stated that besides measles and appendicitis she had had no major diseases. She always felt well except that for the previous six months her eyes had often been dark red. The family and past histories were negative. The patient said that she was not "dieting", but that she did not eat much and did not like fruit. The physical examination revealed only

* See comment on vitamin B complex and hyperthyroidism: *J. Am. M. Ass.*, 1939, 112: 1462.

cavities in the 2 lower left and 1 upper right molar. The gums appeared slightly discoloured and bled on touching with the tongue depressor. Both eyes showed subconjunctival suffusions and a slight oedema of the bulbar conjunctivæ. All other findings were normal.

VOU 20/40 with -0.50 cyl. ax. 90° 20/20.

The treatment consisted in the correction of vision and the instillation of novocain, 1 per cent, adrenalin 1:1,000, 10 drops (b.i.d.), and the patient was advised to consult her dentist and to submit to a laboratory test of blood and urine, which showed a depletion of vitamin C. A balanced diet and fresh fruit as well as additional vitamins for the first five weeks resulted in complete cure.

The tentative diagnosis of vitamin C deficiency was confirmed by the dentist and by the laboratory report. Subconjunctival hæmorrhages are rare. They are usually the result of a trauma or of a vicarious bleeding. Although there is no agreement in the literature as to the existence of a vitamin C deficiency in the eye, it cannot be denied that this patient was cured by vitamin C.

THE RELATION OF THE DIET TO THE EYE

Of all the contents of what is called an adequate diet (proteins, carbohydrates, fats, vitamins, minerals and water) only the vitamins will be here considered. Of these, the vitamins A, B, C, and D have been found to be necessary for the normal function of the eye, and of these four vitamins, the first or vitamin A is the most important and will therefore be emphasized.

Vitamin A is concerned with keratinization, repair and nutrition of the epithelium. It contributes to raising the resistance of the body tissues against infection. There are 4 stages of vitamin A deficiency successively appearing in the eye; (1) nightblindness; (2) dryness of the conjunctiva; (3) pigmentation; and (4) corneal lesions. In some cases the pigmentation appears very early. A peculiar sign is the lack of pain, even in the advanced stages. This is explained by the diminished sensitivity of the cornea. Xerophthalmia is an advanced state of vitamin A deficiency. It is not an infection of the eye, but it may favour one by obstructing the lacrimal ducts with waste material of desquamated epithelium. Specific symptoms of this "local avitaminosis" are cornification and corneal atrophy. As to the influence of bacteria on the course of this affection there is no agreement.³

Nightblindness is the first symptom to appear and the first to disappear in vitamin A deficiency. It is without any doubt responsible

for a great many accidents both at home and on the highways. It is found in states of hunger and occurs in the so-called "idiopathic hemeralopia"⁴ in people exposed to intense sunlight and in those inhabiting dry areas, but it gives no indication as to the progress of the vitamin A deficiency. The cause of nightblindness is not definitely known. It may be either a disturbance in formation of visual purple, or in the lipid content of the rods, or a retinal disease.⁵ The great amounts of vitamin A found in the retina are not pure, but combined with a protein and only traces of it are found in dark adapted eyes which contain much of retinine (a carotenoid substance) instead. The normal retinal pigment plays a vital rôle in the formation of visual purple, and is just as necessary for the cure of nightblindness as vitamin A. This is why retinitis pigmentosa cannot be influenced by vitamin A. Deficient utilization or storage of vitamin A resulting from various diseases may also produce A avitaminosis. The treatment of vitamin A deficiencies may be (1) general (a) oral (either in food, or in form of alpha or beta carotene or of vitamin A, alone or in combination with calcium phosphate or with vitamin D⁶; (b) intramuscular (injections of sterile milk⁷); (2) local⁸; or (3) both general and local.

Vitamin B deficiency may cause blepharitis, keratitis⁹ and cataracts,¹⁰ lesions in the cornea,¹¹ conjunctiva, optic nerve and chiasma,¹² as well as paleness of the disc, central scotomata, pigment shifting, muscle disturbances, asthenopia, photophobia and lachrymation.

Vitamin C belongs to the oxidation reduction system and has been found in the animal and human aqueous humour and lens.¹³ Its deficiency may cause hæmorrhages into the lids, anterior chamber, vitreous humour and retina.¹⁴ Some claim that it is useful in the treatment of cataracts, in which a reduced content of vitamin C has been found.¹⁵ A normal lens can protect vitamin C against oxidation *in vitro*, but a cataractous lens cannot do so. Vitamin C, injected intravenously, passes rapidly into the aqueous and raises its vitamin C content more quickly than in the blood where the vitamin C level is always lower than in the aqueous. This is due to the great permeability of the aqueous barrier which is disturbed in senile cataracts.¹⁶ The vitamin C content of the aqueous may also be raised by pilocarpin, eserine, doryl, or by

illumination, and it may be lowered by adrenalin and atropin.¹⁶ Consequently there must be an influence of the parasympathetic on the ciliary fibres. While the vitamin C content of the aqueous and lens is diminished in ocular diseases (uveitis, glaucoma, retinitis pigmentosa and cataracts), there is no agreement as to its being the cause or consequence of those conditions.¹⁷ In fact, it has not been shown conclusively that a vitamin C deficiency in the eye actually exists.¹⁸

Vitamin D is more effective in combating certain scrofulous conditions when combined with vitamin A. It may be used locally, orally, or in intramuscular injections. It may favourably influence a keratoconus,¹⁹ xerophthalmia, phlyctenular conjunctivitis,²⁰ corneal lesions, vascular and epithelial formation, and even strabismus.²¹ It has been found definitely useful when combined with calcium phosphate.

COMMENT

Xerophthalmia, and particularly phlyctenulæ, occur more often in children than in adults, and chiefly among the poor and unintelligent people where bad hygiene, lack of food, and poverty prevail. The above cases, however, do not concern children, but highly cultured, well-to-do people. They are, therefore, splendid examples of what may be justly called "starvation in the midst of plenty". There can be no question here of mental imbalance or of lack of food or of inability to purchase it because of poverty. Although it is hard to believe, such conditions (vitamin deficiencies) are widespread, and certainly in a greater number than generally seen, particularly those of the subclinical type.

It goes without saying that vitamin deficiencies can be easily prevented with the co-operation of physicians and by education of the public.

The few mentioned cases cannot give an exact picture of the prevalence of vitamin deficiencies. The fact that they were observed within a short time does not mean that a large part of such nutritional disturbances come to the attention of physicians. Also, even those familiar with all the aspects of the endocrine-vitamin relationship do not always consider deliberately the possible consequences of a prescribed intake of thyroid or of other hormones. On the other hand, there are patients who do not return to

their physician for further consultation, nor do they always strictly follow his instructions. There are also people who, for one reason or another, never consult their physician, and only when incapacitated by an advanced vitamin deficiency symptom do they come to the clinic or see their private specialist.

From the observed cases it is impossible to deduct or to infer anything about the number and extent of vitamin deficiencies, but it is certain that there are enough of them to present a medical and a public health problem. It is needless to add that there must be thousands and probably millions with the subclinical type of deficiencies. Obviously, the latter can be found only accidentally or when purposely looked for. It must be remembered that even healthy persons with balanced diets, lest they may exhaust their stored vitamins, require additional vitamins under certain circumstances. Thus, those exposed to intense sunlight, prolonged working or driving at night in blinding light, or those indulging in alcohol require various vitamins in addition to their balanced diets. The same applies to growing children and to the aged. But most important are the cases of obesity and of those using advertised remedies or other reducing drugs without medical advice. This is indeed not only a medical but also a public health problem which can be easily solved by calling it to the attention of physicians and by an intensive public health education dealing not alone with planning, preparation, and the use of balanced diets but also with the dangers resulting from the misuse of drugs without medical supervision. It should not be forgotten that, great as the benefits of vitamins might be, an overdosage may cause various disturbances which are often greater than those which existed before treatment was begun.²² It is therefore necessary not only to be familiar with the vitamin treatment and the physical condition of each individual patient but also to observe him at frequent intervals until he is cured. It is more advantageous to prolong the treatment by keeping within the physiological doses than to try to accelerate it by larger doses.

SUMMARY

1. Reducing diets are shown to be the cause of vitamin deficiencies.
2. Unsupervised or self-medication contributes to the aggravation of deficiency symptoms and often to permanent injury.

3. Five cases illustrating such deficiencies are cited.

4. The influence of vitamins on the eye is outlined.

5. The necessity of detection and of prevention of unsuspected vitamin deficiencies is emphasized.

CONCLUSION

Considering the availability of food and of low-cost diets as well as of competent medical advice vitamin deficiencies are, at present, unjustifiable. Such deficiencies can be prevented by the co-operation of physicians in the earlier and more thorough application of the vast knowledge on the subject and by an intensive public health education. Providing every new patient, regardless of his complaint, with a printed outline of the importance of a balanced diet and of the dangers resulting from malnutrition or from an unsupervised intake of reducing drugs will greatly contribute to a reduction and possibly to an elimination of vitamin deficiencies. Such printed material could be supplied to physicians or hospitals by local or state health authorities.

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NOTE.—Those specially interested in this subject will find a complete bibliography (130 items) in an article by the author, entitled "Action of hormones and vitamins on the eye" which appeared in *The Eye, Ear, Nose and Throat Monthly* for December, 1938.

A SURVEY OF THE OPHTHALMIC CONDITIONS AMONG RURAL SCHOOL CHILDREN*

BY JOHN V. V. NICHOLLS

Department of Ophthalmology, Royal Victoria Hospital, Montreal

IN October, 1939, a survey to investigate the occurrence of abnormal ophthalmic conditions was carried out in Pontiac County, P.Q. among the school children. All pupils in the schools visited were examined, comprising 521 children, 238 male and 283 female, between the ages of 5 and 20 years inclusive. There was no selection of cases. In each instance the eyes were examined for any abnormalities in the anterior segment, adnexa and extraocular movements. The visual acuity was recorded for each eye, using Snellen's test

types at 20 feet under proper illumination. Every child showing subnormal visual acuity, abnormalities of the anterior segment, or anomalies of the extraocular movements was examined further under the action of a cycloplegic. Refractive corrections, when given, were based upon retinoscopy carried out under the cycloplegic. The results of this survey, when examined statistically, show how necessary it is that proper medical attention in regard to vision be carried out among the school children in the rural districts.

In Table I all the ophthalmic disturbances found are recorded. The sex and total incidence of each are listed. It will be noticed

* Conducted under the ægis of the Quebec Division of the Junior Red Cross Society, and with the kind co-operation of the local school board and medical practitioners.

TABLE I.
OPHTHALMIC CONDITIONS

PATIENTS EXAMINED: TOTAL, 521; MALE, 238; FEMALE, 283

No.	Diagnosis	Per- Male centage	Per- Female centage	Per- Total centage
1	Epicanthus.....	1 0.42	0 0	1 0.19
2	Blepharitis.....	1 0.42	3 1.1	4 0.76
3	Hordeolum.....	0 0	1 0.35	1 0.19
4	Chalazion.....	0 0	1 0.35	1 0.19
5	Microcornea....	1 0.42	0 0	1 0.19
6	Conical cornea...	1 0.42	0 0	1 0.19
7	Persistent hya- loid artery....	0 0	1 0.35	1 0.19
8	Lenticonus.....	0 0	1 0.35	1 0.19
9	Subnormal visual acuity.....	54 22.7	101 35.7	155 29.7
10	Hypermetropia requiring correction....	3 1.3	2 0.70	5 0.96
11	Hypermetropic astigmatism....	12 5.0	12 4.2	24 4.6
12	Myopia.....	9 3.8	29 10.2	38 7.3
13	Myopic astigma- tism.....	2 0.84	9 3.2	11 2.1
14	Mixed astigma- tism.....	0 0	2 0.70	2 0.38
15	Anisometropia (marked).....	4 1.7	6 2.1	10 1.9
16	Amblyopia asso- ciated with strabismus....	2 0.84	2 0.70	4 0.76
17	Amblyopia asso- ciated with anisometropia.	3 1.3	0 0	3 0.57
18	Amblyopia—no cause found...	1 0.42	1 0.35	2 0.38
19	Strabismus, convergent, alternating....	2 0.84	2 0.70	4 0.76
20	Strabismus, convergent, monocular....	2 0.84	2 0.70	4 0.76
21	Strabismus, divergent, alternating....	1 0.42	8 2.9	9 1.7
22	Strabismus, divergent, monocular....	0 0	0 0	0 0
23	Convergence deficiency.....	1 0.42	6 2.1	7 1.3
24	Patients already wearing glasses	12 5.0	23 8.1	35 6.7
25	Glasses pre- scribed.....	9 3.8	23 8.1	32 6.1
26	Night blindness (vitamin A de- ficiency).....	1 0.42	0 0	1 0.19
27	Congenital macu- lar degeneration with nystagmus	1 0.42	0 0	1 0.19
28	Total of all eye abnormalities..	123	235	358

that inflammatory lesions were quite uncommon, as one might expect in a rural community. Developmental defects were also very uncommon. It should be noted that one case of lenticonus, a condition of extreme rarity, was found. The patient, a female of 15 years, had a visual acuity in the left eye of 6/60 and in the right eye of 6/15. One patient suffering from micro-

cornea also was found. This was associated with hypermetropia of +3.50 diopters and a right convergent concomitant strabismus of 25°.

Possibly the most interesting results in the survey are obtained by analysis of the findings in regard to visual acuity, refractive errors, and strabismus. Firstly, it was found that a surprisingly large number (29.7 per cent) of all children had subnormal visual acuity from one cause or another. This was more frequent among the girls because of the greater incidence among them of myopia. In Table II the sex and age incidence of subnormal visual acuity have been analyzed. The incidence gradually decreased until the child reached 7 years, probably due to greater development of critical visual power and attention. Then it gradually increased throughout the succeeding years owing to the development of myopia, astigmatism, etc. Table III, shows a similar analysis of those who could have the visual acuity brought up to normal by refractive correction, while Table IV contains an analysis of those in which this could not be done. These figures do not agree with those found in some surveys in the United States, which seem considerably too high.^{1,3} The visual acuity of children at different ages there was found as follows:—

3 - 4 years	16	per cent	had	20/20	vision
4 - 5 "	23	"	"	"	"
5 - 6 "	38	"	"	"	"
6 - "	58	"	"	"	"
6 - 7 "	52	"	"	"	"
8 - 9 "	56	"	"	"	"
10 - 11 "	61	"	"	"	"
12 - 13 "	70	"	"	"	"
14 years and over	75	"	"	"	"

The last group, recorded in Table IV, contains all those suffering from subnormal visual acuity relative to strabismus, suppression, and other such causes. It also contains quite a number that cannot be classified. It would seem that some children either do not have the retinal or cerebral substance to see with or they have not developed a fully critical visual power.

From Table I it will be noticed that there was a slightly greater tendency to develop hypermetropia and hypermetropic astigmatism among boys than among girls. This is accounted for by the greater tendency of girls to develop myopia.

TABLE II.
AGE AND SEX INCIDENCE OF SUBNORMAL VISUAL ACUITY IN PERCENTAGES

Sex	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.	19 yrs.	20 yrs.	Total
Male..	0	17.6	0	21.7	34.6	30.0	25.0	10.7	25.0	29.4	16.7	40.0	0	20.0	0	100.0	22.7
Female	33.3	12.5	21.0	30.8	29.2	28.0	51.5	52.1	26.7	29.4	40.0	36.0	50.0	57.1	50.0	0	35.7
Total..	20.0	15.2	11.4	25.0	32.0	29.4	40.3	29.4	26.3	29.4	33.3	37.5	38.1	41.8	40.0	50.0	29.7

TABLE III.
AGE AND SEX INCIDENCE OF SUBNORMAL VISUAL ACUITY CORRECTED BY REFRACTION IN PERCENTAGES

Sex	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.	19 yrs.	20 yrs.	Total
Male..	0	0	0	17.4	19.3	16.7	20.8	3.6	18.7	23.6	16.7	20.0	0	20.0	0	0	13.4
Female	0	6.3	5.3	15.4	12.5	19.1	33.3	30.4	20.0	17.6	16.7	16.0	31.3	28.5	25.0	0	19.4
Total..	0	3.0	2.8	16.7	14.0	17.7	28.0	15.7	19.7	20.6	16.7	17.5	23.8	25.0	20.0	0	16.6

TABLE IV.
AGE AND SEX INCIDENCE OF SUBNORMAL VISUAL ACUITY WHICH COULD NOT BE FULLY CORRECTED BY REFRACTION, IN PERCENTAGES

Sex	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.	19 yrs.	20 yrs.	Total
Male..	0	17.6	0	4.3	19.3	13.3	4.2	7.1	6.3	5.8	0	20.0	0	0	0	100.0	9.3
Female	33.3	6.2	15.7	15.4	16.7	9.9	18.2	21.7	6.7	11.8	23.3	20.0	18.7	28.5	25.0	0	16.3
Total..	20.0	12.1	8.6	8.3	18.0	11.7	12.3	13.7	6.5	8.8	16.7	20.0	14.3	16.7	20.0	50.0	13.1

TABLE V.
AGE AND SEX INCIDENCE OF MYOPIA IN PERCENTAGES

Sex	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.	19 yrs.	20 yrs.	Total
Male..	0	0	0	0	3.8	0	4.2	3.6	18.7	17.6	8.3	0	0	20.0	0	0	4.6
Female	0	0	0	0	8.3	9.5	15.1	8.7	16.7	17.6	16.7	20.0	18.8	57.1	25.0	0	13.4
Total..	0	0	0	0	6.0	3.9	13.3	5.9	17.4	17.6	14.2	12.5	14.3	41.7	20.0	0	9.4

If the age and sex incidence of *myopia* be analyzed, as in Table V, some rather interesting results are obtained. It will be seen that 9.4 per cent of all the children had myopia. This figure agrees very closely with that found by Jackson² in a much larger series of school children. In the present series 4.6 per cent of the boys were so affected, while 13.4 per cent of the girls suffered from it. From Table V it will be seen that no myopia was found in pupils under the age of 9 years. During the later years of life the incidence, roughly speaking, gradually increased.

A study of this analysis of myopia discloses quite a number of the usual etiological factors to be operating. Of the 49 pupils found to have myopia in both sexes, only 2 (one of each sex), could be said to be definitely congenital, that is, 0.38 per cent, which is an extremely small proportion. This figure agrees very closely with that of Jackson. In the others several factors could be found at work. (a) *Sex*.—

Myopia was almost three times as frequent among the girls. (b) *Heredity*.—It was found that 57.1 per cent of all sufferers were related in some degree. (c) *Puberty*.—It will be noticed that myopia starts about the age of 9 years, just on the threshold of tremendous changes in the body, a period when sudden and great growth may produce malnutrition, particularly lack of calcium. (d) *Astigmatism* producing eye strain is also probably a factor. In Table I it will be seen that hypermetropic astigmatism was slightly more common among the boys, while myopic astigmatism was much commoner among the girls. Another factor should be considered. It will be remembered that the eye normally reaches its full size at the age of 7 years.⁴ If it were possible to use more delicate methods than retinoscopy for refraction one would probably find a beginning of the process not at the age of 9 years as was recorded, but at 8 years. It is possible therefore that myopia is due, in

part at least, to a failure of the eye to cease increasing in size.

Anisometropia of marked degree, that is, a difference between the two eyes of 1.50 diopters or more, was not particularly common.

In Table I an analysis of the occurrence of *amblyopia* will be found. Only a very small percentage of the cases could be classified as congenital. Also it will be seen that about 3.2 per cent of all children had *strabismus*. Convergent strabismus was about equally distributed between the sexes, while divergent strabismus was much commoner among the girls. This result is partly accounted for by the fact that three female members of the same family had a congenital total absence of convergence. This, of course, was associated with divergence. All three girls were found to have a normal refraction. Three other unrelated girls were found suffering from the same condition.

Glasses were prescribed in 6.1 per cent of all the pupils examined, as compared to 6.7 per cent already wearing glasses. In six of those wearing glasses, the correction was of the order of $+0.50$ sphere and absolutely unnecessary. It is pleasing to note that in no case was an oculist responsible for the error in diagnosis. When this number is subtracted from the number of those already wearing glasses, it is found

that just about as many more should wear glasses as those found already wearing them.

It should be noted here that in many of the cases of low refractive error no correction was prescribed. For example, small degrees of astigmatism, such as ± 0.50 , were never corrected, and only rarely, where there were definite symptoms of asthenopia, were cylinders of 0.75 prescribed. In regard to the cases of myopia the same holds true; no -0.50 spheres were prescribed. In hypermetropia the condition had to be of high degree or there had to be some related condition such as strabismus before glasses were prescribed.

From the foregoing it can be easily seen how important such routine examination is among school children. Not only rural school children but also those going to urban schools should be examined periodically if they are to be able to enter upon their studies as unhampered as possible.

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THE INDUCTION OF LABOUR*

BY W. PELTON TEW

London, Ont.

THIS term means the interruption of pregnancy at or near term. In this paper I will confine it to the interruption of pregnancy after the child has become viable. One of the earliest records of this procedure is that of Louise Bourgeoise in 1608. She was midwife to Marie di Medici and introduced it as a therapeutic measure. Smellie used the procedure in 1756. Denman in 1793 reported 20 cases of induced labour for contracted pelvis. Since that time many thousands of women have had their labours induced, with varying results both for the mothers and the babies. The several controversial sides of the question are still

unsettled. The pendulum is still swinging back and forth. One fact however has been clearly settled, namely, that the induction of labour definitely forms a part of our present day therapeutic measures, the main issues being (a) When should we use it? and (b) what method should we use? Finally, we must learn at the outset to individualize our patients chosen for induced labour and to adopt the method most suitable for each case.

INDICATIONS FOR INDUCING LABOUR

(1) Contracted pelvis; (2) diseases incidental to pregnancy; (3) diseases accidental to pregnancy; (4) habitual death of the fetus after viability; (5) prolonged pregnancy and overgrowth of the child.

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CONTRACTED PELVIS.—Avicenna (979-1037) first recommended induction of abortion in contracted pelvis. In the middle of the 19th century the practice was fairly common because the mortality from Cæsarean section was terribly high. The procedure is in use today to some extent but not nearly as commonly as a few years ago. In order to clarify this question I would like to use a simple clinical classification of contracted pelvis: (1) Inlet contractions, including (a) major pelvic contraction; (b) moderate contraction; (c) minor contraction; (2) outlet contraction.

Major pelvic contraction means that the true conjugate is under 7.5 cm.; moderate contraction, that the true conjugate is between 7.5 and 9 cm.; minor contraction, that the true conjugate is over 9 cm. In the final analysis it is the relative size of the baby's head to the mother's pelvis which really counts.

The general management of these cases of contraction may be summarized as follows:—

Major contraction—the usual treatment would be Cæsarean section at or near term.

Moderate contraction. (1) Endeavour to keep the head presenting pre-natally; a head-first delivery is safer than a breech for mother, baby and doctor. (2) Send the patient to the hospital for delivery if possible. (3) If the head is presenting and fairly well fixed at or near term a trial labour is justified because many of these will come through safely. (4) If the patient is a primipara and the head not fixed, or not well fixed, a Cæsarean section is justified. (5) Cæsarean section at or near term is better than a labour induced too prematurely.

We may therefore reduce the management of these cases of moderately contracted pelvis to two procedures—permitting the labour to take its course, so-called trial labour, and Cæsarean section. Induction of labour for these cases is reserved for use only for the cases which tend to go beyond the calculated date of full term.

Labour in cases of minor degrees of contraction usually always terminates safely unless the child is abnormally large. In the lower limits of these contractions an induction should be done at about full term in order to prevent the patient going into post-maturity. According to J. M. Munro Kerr¹ induction of labour in a primigravida with a border-line pelvis should not be considered except under very special circumstances.

Outlet contraction (funnel pelvis) occurs to some degree in about 6 per cent of all women, and is probably the most common type of pelvic deformity in American white women. Usually the contraction is limited to the transverse diameter of the outlet. This diameter may be reduced from 10.5 cm. to 7.5 or 8 cm. The ischial spines feel prominent on examination. During labour resistance is met when the head reaches the level of the ischial spines. The head undergoes extreme flexion as in a generally contracted pelvis. In severe cases complete arrest of the head occurs. If the outlet deformity is discovered before labour begins the general principles as above outlined for inlet deformities may be applied. If it is discovered after the onset of labour the following may be applied. Minor degrees of contraction usually cause little if any difficulty. Major degrees will require special management, such as Cæsarean section for selected cases. The moderately contracted outlet might be proceeded with as follows: (a) Try the exaggerated lithotomy position; (b) prolonged expectancy; (c) forceps; (d) pubiotomy; (e) craniotomy, if the baby is dead.

The induction of labour for outlet contractions is therefore not very often used because of these obvious reasons. For major degrees of contracted outlet Cæsarean section is the method of choice; the minor degrees rarely cause any trouble; the moderate degrees are better dealt with by other methods.

DISEASES INCIDENTAL TO PREGNANCY include the following: pre-eclampsia and eclampsia, placenta prævia, accidental hæmorrhage and polyhydramnios. The essential point in the management of these cases is to interrupt the pregnancy before either the mother's or baby's health or life are too greatly endangered. This requires fine obstetric judgment, and doubtless most of us are still using the wrong judgment at times for some of these patients.

Pre-eclampsia.—Commonly, the pre-eclamptic patient will respond quite well to proper management for the first few days or longer. One endeavours to keep the condition under control and to get the patient as close to full term as possible. Many of them may be safely guided to full term. The special indications for terminating pregnancy are: (a) A noticeable increase in the severity of the symptoms irrespective of proper management, such symptoms

as decrease in the output of urine, rising blood pressure, increasing albumin, the appearance of headache and eye symptoms, retinal hæmorrhages.

The method of induction for the pre-eclamptic will depend upon the urgency of the particular case; in other words, one has to select the method suitable for the individual case. An outline of the methods would be as follows. If the patient is at or near term and the case moderately urgent you resort to one of the following procedures. If a primipara and the head rather high a Cæsarean section might be considered. If a primipara with head low in the pelvis, or a multipara, one may rupture the membranes and make sure most of the fluid escapes, and one hour later give pituitrin 0.5 c.c. intranasally. Bag or bougie used if response is not satisfactory. If the case is one of real urgency one would proceed as follows. If the woman is a primipara with a high head a Cæsarean section might be considered. If the head is low rupture the membranes well, slipping them back, and give 0.5 c.c. pituitrin. Bag or bougie used if response is not satisfactory.

The cardinal points to keep in mind while managing the pre-eclamptic patient are: attempt to get her as near term as possible. Avoid subjecting the mother to too much risk because of the danger of the toxæmia doing permanent damage. Endeavour to interrupt the pregnancy by the best and easiest means suitable for the particular case. Reserve Cæsarean section for properly selected cases.

Eclampsia.—The aims in the treatment of the eclamptic patient are to gain adequate control of the convulsions at the earliest possible moment; to reduce waterlogging; to assist with the delivery at the proper time and by means of the method most suitable for the case in hand.

Our first aim is to control the convulsions and to improve the patient's condition. In other words, we neglect the labour in the first instance until our patient has been given a chance to improve. If labour begins itself all the better, and we stand by prepared to assist as required. If labour does not begin our management might be summarized as follows. If the patient definitely improves and continues to improve one is justified in waiting, even for a few days. This however is not the usual procedure, because it is safer to start labour. For

this patient one may rupture the membranes and make sure the fluid is well drained off. If the patient does not improve or gets worse one proceeds as follows. If she is a primipara at or near term with a high riding head or a malpresentation a Cæsarean section would be justified. If the patient is a primipara with the head low in the pelvis or a multipara rupture of the membranes may be practised, with or without the additional use of a bag and bougie.

Placenta prævia.—In the main placenta prævia today is best treated by means of Cæsarean section. However, for certain marginal cases, particularly in multiparous patients, one may utilize one of the following procedures. Simply rupture the membranes and permit the head to slide down, compressing the placenta and controlling the hæmorrhage. This may be supplemented by the use of the Willett forceps. Introduce the hydrostatic bag for certain of this class of patient.

Accidental hæmorrhage.—Accidental hæmorrhage may for clinical purposes be divided into three classes, mild, moderate, and severe. The treatment of the three is of two types, conservative and surgical. In a few isolated instances all three types are treated by means of Cæsarean section; in other hands all three are treated by the conservative method. Most of us however prefer to choose the treatment best suited for the particular patient. This middle course of management might be summarized as follows: (1) The mild type may or may not need an induction of labour. In case we decide to induce labour the Dublin method of packing the cervix and vagina followed by rupturing the membranes is all that is necessary. (2) The moderate type may be quite safely treated by means of the Dublin method, namely, packing cervix and vagina followed by rupturing the membranes, or by simply rupturing the membranes. (3) The severe type may again be treated by the Dublin method or by Cæsarean section. We conclude therefore that the Dublin method of inducing labour and controlling hæmorrhage in most cases of accidental hæmorrhage is highly satisfactory in the long run.

Polyhydramnios.—The acute form of polyhydramnios is more likely to cause complications than the chronic form. Pressure symptoms are the most common symptoms causing one to decide to interrupt the pregnancy. The simplest method is to rupture the membranes.

DISEASES ACCIDENTAL TO PREGNANCY.—The common diseases occurring accidental to pregnancy and likely to bring up the question of the induction of labour are nephritis, tuberculosis, heart disease, diabetes, and psychoses.

Nephritis.—Sir William Osler once made the statement that a woman with chronic nephritis should not marry, and if she married she should not have children. Since that time however we have changed our minds considerably concerning the question of kidney disease and pregnancy. Today we feel that some patients with chronic nephritis may fairly safely have children. The question is how much kidney function has the patient actually got. Providing her kidney function is reasonably good and she is carefully guided through her pregnancy we feel that such a patient may with a fair degree of safety go through her pregnancy. She will likely, however, have to limit her family according to her kidney function. If such a patient is found to present definite signs of kidney failure during pregnancy the pregnancy should, usually speaking, be interrupted. At or near term the medicinal method of induction should be tried, and if this fails one of the mechanical methods may be used, depending on the urgency of the case.

Pulmonary tuberculosis.—Only exceptionally does phthisis form an indication for the termination of pregnancy. A patient with active pulmonary tuberculosis and in the early weeks of pregnancy, say under ten weeks, may be a suitable candidate for an interruption of her pregnancy. When pregnancy is farther advanced induction of labour offers no advantage.

Heart disease.—During pregnancy extra stress is thrown upon the heart and the circulation, due to the increase in body-weight, increase in blood volume, upward pressure on the diaphragm, and the interposition in the circulation of the retroplacental vascular field. These factors are increased as pregnancy advances. The healthy heart meets these demands without trouble, but the damaged heart is unable to do so. The final question is one of cardiac reserve and function. The gravity of valvular disease complicating pregnancy has been greatly overestimated. It is not a question therefore of valvular disease but one of cardiac function. Pregnant women with heart disease must be treated primarily as cardiac patients. So long as compensation is within normal limits one carries the patient along on proper cardiac man-

agement. Most of these patients may be carried to full term or near full term. Obstetric interference is seldom necessary in the later months for patients with heart disease. The induction of labour is not justified if heart failure is present. If the patient is near term and a prolonged or difficult labour is anticipated a Cæsarean section under spinal anæsthesia should be considered.

Diabetes.—The gravity of pregnancy as a complication of diabetes has almost vanished since the introduction of insulin in 1924. Most diabetic patients pass through pregnancy and labour without serious difficulty now. Diabetic patients should be under close supervision and management throughout their pregnancy. Occasionally, however, in severe cases where pancreatic damage is feared, one may have to interrupt the pregnancy. This would be evidenced by a rising blood sugar and the presence of ketosis irrespective of adequate treatment. If such a case arises and interruption is necessary one must choose the method with care. Spinal or regional anæsthesia should be used instead of inhalation. If the patient is at or near full term and a prolonged or difficult labour is anticipated one should resort to a Cæsarean section under spinal anæsthesia.

Psychosis.—Mental disease of itself does not permit us to induce labour. There must be some physical reason present which calls for the induction of labour. A pregnant patient with mental disease is treated as a mental patient, and the pregnancy is looked after in the routine manner. The question of interrupting an early pregnancy in certain cases of mental disease does not come under the scope of this paper.

HABITUAL DEATH OF THE FETUS AFTER VIABILITY brings up an important obstetric problem. This is a rare condition and often the cause is unknown. When the baby becomes viable one tries to get it as near term as possible without waiting too long and so losing it. The method of induction here would be chosen according to the nearness of the patient to full term. The medical method could be tried in all cases, and if it fails one of the mechanical methods could be resorted to.

PROLONGED PREGNANCY AND OVERGROWTH OF THE CHILD.—Unduly prolonged pregnancy is rather rare. Before deciding that a pregnancy is really prolonged one should check up all

factors carefully, such questions as follows should be reviewed with care. (1) Has the patient miscalculated her dates? (2) Did she have a false period or so after becoming pregnant? (3) Has she a multiple pregnancy? (4) Has she a polyhydramnios? (5) Has she a pelvic or abdominal tumour? I feel that it is quite rare for a patient to go very far beyond her actual date. I usually depend considerably on the patient's weight-loss which occurs as she nears full term. Ordinarily this is a good reliable guide unless the patient is toxic, or for some other reason she is gaining weight near term instead of losing. An x-ray of the baby's skull *in utero* in suspicious cases is of some help, but should not be entirely depended upon. However, post-maturity will occur occasionally and the baby will overgrow.

The French law recognizes the legitimacy of a child born 180 days after marriage, and 300 days after the death of the husband, the German law allows 181 days and 302 days respectively. In England the court in 1921 allowed the legitimacy of a child born 334 days after the husband went to India. Fothergill reports a Cæsarean section 342 days after the last coitus. In America each case is decided on its individual merits. Some claim that about one out of every 200 pregnant women definitely goes beyond full term. Young women are more likely to go into labour at term than older women who tend to go beyond full term before labour onsets. Women who have a delayed puberty are more likely to go beyond term. Male babies are said to be carried longer than females. Women leading active lives near term are less likely to go beyond term than those leading sedentary lives. Women are less likely to go beyond term in summer than in winter. Heredity seems to play a part. An endocrine disturbance may act as the cause in some cases, *e.g.*, a low blood oestrin or an abnormally high progesterone may act as a cause of prolonged pregnancy. When one is reasonably sure that the patient is going beyond full term labour should be induced. The simplest method would be to try the medical method, which usually works under such circumstances.

The following abnormalities should be looked for in patients who are definitely over term: (1) poor cephalic moulding; (2) abnormal presentations, particularly occipito-posteriors; (3) deflexed attitudes of the head; (4) some

disproportion of baby's head and mother's pelvis; (5) irregular pains when labour does start. These do not of course always occur, but there is, seemingly, a definite tendency for such abnormalities to occur. Generally speaking, pregnancy should not be permitted to go beyond full term. A good general rule is to allow the woman one week beyond her expected date, and then check again carefully, and if one is reasonably sure that she is going over term a medical induction is justified, should be advised, and carried out if she agrees.

A BRIEF REVIEW OF THE METHODS USED FOR INDUCING LABOUR

Twenty or more methods are available, but only the best of these will be reviewed here. The method of choice will depend considerably on the urgency of the particular case.

Medical induction.—This is particularly applicable when there is no special hurry for the delivery, and when the patient is at or near term or beyond full term. It is effectual in about 70 per cent of cases at or near term. The method advised is as follows. 10.00 p.m., oestroform intramuscularly; 6.00 a.m., 1 ounce of castor oil; 7.00 a.m., a copious enema and quinine hydrochloride, gr. x, in capsule, by the mouth; 8.00 a.m., 1 c.c. pituitrin (B. & W.), intranasally. Repeat with 1 c.c. of pituitrin every hour, alternating the nostrils for 6 or 8 times if necessary. Stop induction as soon as labour is definitely established. The nasal plug should be withdrawn whenever labour definitely begins.

Certain warnings regarding the use of pituitrin should here be given. Pituitrin should not be repeated until the patient has been checked by a competent house surgeon or the physician himself. If pituitrin is being used intramuscularly the needle plunger should be withdrawn slightly before injecting the solution, for fear the point of the needle is in a blood vessel. If the uterus tends to remain constantly firm or hard, and does not relax properly between contractions, no further pituitrin should be given. In some cases acting like this morphine should be given in order to check the uterine spasm, thus possibly saving the life of the baby, or avoiding uterine rupture. This last warning is a very definite one, and should be kept in mind with any induction where pituitrin is being used.

The original method of medicinal induction of labour was introduced by Prof. P. P. Watson in

the year 1922. This paper was the best paper in the English language on the subject of labour induction. His method is probably the most common method in use today. The technique, as outlined by him, is somewhat as follows: 6.00 a.m., castor oil, 1 ounce; 7.00 a.m., copious enema; 7.00 a.m., quinine hydrochloride, gr. x; 10.00 a.m., quinine hydrochloride, gr. x or v; 1.00 p.m., quinine hydrochloride, gr. x or v; 1.30 p.m., pituitrin (intramuscularly), 0.25 to 0.50 c.c.

Repeat pituitrin, 0.25 to 0.50 c.c. every half hour, until labour pains are established. The induction is stopped as soon as the pains definitely occur. Since that time it has been proved that the quinine may have an accumulative effect on the baby and a certain number of still-births are claimed to have been due to the accumulation of quinine in the baby. Quinine requires about eight hours to be eliminated from the body; hence, if ten-grain doses are given at three-hour intervals an accumulation of the drug is very likely to occur. It is in part due to this fact that I have reduced the dose of quinine in induction cases.

Mechanical methods.—Puncture of the bag of water is one of the oldest methods known, and was reported on in 1793 by Denman. This method is still in use, either alone or in combination with part of the medical technique mentioned above. According to Eastman² puncturing of the membranes is successful in 98 per cent of patients at term. In 2 per cent the latent period is unusually long, and in these cases the likelihood of infection is definitely increased. This method is therefore not without some danger and should be used only when specifically indicated. Three conditions must be present before artificial rupture of the membranes is safe. The lowermost part of the head must be at or below

the level of the ischial spines. The patient must be at or near her expected date of confinement. The cervix must be soft and the cervical canal less than 1 cm. long. Absence of any one of these constitutes a definite contraindication for the use of this method. When the three above mentioned conditions are present the medical method is very likely to be successful, and I therefore prefer to try it first. If the medical fails one may then resort to puncturing the membranes, providing the three mentioned conditions are present.

Induction by means of bougies is useful in cases where the first two mentioned methods are contraindicated, particularly when the patient is three or four weeks ahead of her expected date. It is effectual in about 75 per cent of cases. It is more dangerous than either of the first two mentioned methods and should only be used when particularly indicated.

The hydrostatic bag may also be used in cases where the first two methods are contraindicated, particularly when the patient is three or four weeks ahead of full term. Its field of usefulness may be somewhat limited to the following circumstances—certain cases of placenta prævia; certain cases of premature rupture of the membranes in which medicinal methods have failed to induce labour; and certain cases of uterine inertia. The induction of labour by bag and bougies combined is applicable to cases under similar circumstances, as outlined above, where the bag or bougies were being used alone. It is just a little more certain of initiating pains a little sooner than either the bag or bougies alone.

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AN INTERNAL SANITARY PAD.—W. B. writes: I am rather surprised that the recent correspondence in your columns on this subject should have been in the main unfavourable, because several of my patients, who have been using this sanitary pad for some months now, have been very satisfied and have given up the use of the orthodox external pad. So much so that instead of advising against it when asked, as your other corres-

pondents have done, I have kept an open mind about it until more comprehensive results are available, and have advised each patient to try it for herself. One fact at least is evident—that most women welcome the idea of a vaginal pad, since however much they may be used to the external pad they are always conscious of its presence, and even if in some cases there is no actual discomfort or labial chafing, no one can say that it is really comfortable.—Correspondence in *Brit. M. J.*

THE MANAGEMENT OF DELAYED LABOUR*

BY G. C. MELHADO

Montreal

WHILE there is no arbitrary limit to the time required to complete a normal labour, it is usually conceded that labour in the primipara takes about 18 hours, and in the multipara about 12 hours. It is equally true that many labours lasting a considerable longer time terminate spontaneously without any obvious deleterious effect on the child or mother.

Factors accounting for delay, while sometimes simple, are more often complex. They may be either those of the expulsive forces, of which the uterine muscle is the most important, mechanical faulty positions, attitudes, etc., or, the more usual, a combination of these. Any or all of these factors may be present in the first or second stage of labour. Again, a factor responsible for delay in the first stage may correct itself in the second stage and the progress of labour continue in a normal manner. It is not uncommon to see a state of primary uterine inertia disappear after eventual dilatation of the cervix and rupture of the membranes; the converse, however, is more often true.

Primary inertia as a clinical entity is always recognizable. Its management however, is often difficult. Women with certain endocrine stigmata—the short-necked, thick-set, stoutish woman, of short waist, with flattish or spade-like hands, well padded hips and thighs, frequently presents this type of labour, so-called endocrine dystrophy dystocia syndrome. On the other hand it is not uncommon to find a similar kind of labour in those with the more masculine characteristics.

In true primary inertia the membranes are apt to rupture early, even before the onset of pains. The cervix dilates very slowly. The lower uterine segment is often imperfectly developed, and the head especially, if in a posterior occiput position, does not seem to fit well down on the cervix, the latter at times lying free beyond the head. The pains are nagging in character, frequently situated low down in the back or lower abdomen, radiate down the

thighs, are irregular, and of poor quality; or, again, there may be a type of pain described as colicky action of the uterus and, according to Phillips,¹ readily recognized in that the painfulness of the uterine contraction persists after the palpable hardening brought about by uterine contraction has passed off. Associated with this type of labour there is often a corresponding lack of tone in the bladder and large bowel resulting in distension, so that the bowel and stomach may be seen in their entirety and frequent catheterization of the bladder becomes necessary. Whether this phenomenon is due to a sympathetic or to an endocrine dyscrasia is not entirely clear.

It is a moot question whether the early rupture of the membranes plays any part in the prolongation of labour. Many textbooks maintain that the hydrostatic effect of the bag of waters is of considerable importance in causing easy and progressive dilatation of the cervix. Williams² textbook states that after obliteration has occurred “dilatation is brought about almost entirely by the force exerted by the bag of waters”. Similar views have persisted from the time of Guillemeau. Thomas Denman³ upheld the hydrostatic wedge theory; on the other hand Smellie,⁴ cautioning against rupture of the membranes, stated “the membranes appear to play no part in labour except to hold in the water necessary for lubrication. Dilatation is effected by the head.” Baudelocque,⁵ in 1789, held a gloomy prognosis for dry labour. However, he warned the “dilatation is not immediately and entirely the effect of that species of wedge”. De Wees, quoting from King,⁶ pointed out that if the membranes were a dilating wedge they must be stronger than the cervix, and compared the ease with which the membranes ruptured at the slightest touch with the difficulty of manual dilatation. Again, in the absence of membranes labour should be almost impossible or very difficult, which he found “contrary to experience”, in spite of occasional exceptions. King, investigating the problem clinically, found “the results support the explanation of cervical dilatation suggested by De Wees, that in labour

* A paper read at the Seventieth Annual Meeting of the Canadian Medical Association, Section of Obstetrics and Gynaecology, Montreal, June 21, 1939.

the cervix is gradually retracted over the head by muscular action alone; while the hydrostatic wedge theory, disputed since the eighteenth century, appears to be incompatible with the results of his investigation, in as much as the membranes proved to be unnecessary for a safe easy and short labour". Similar views have been expressed by Fitzgibbon⁷ and many others. Schultze⁸ in 1929 found that in 6,500 deliveries labour was delayed in 12.4 per cent, whereas the figure was 8.4 per cent in dry labours. Kreis⁹ also has shown that at any given time a greater percentage of women will have completed the dilatation and delivery in the absence of membranes than with intact membranes. Irwin states "At the beginning of labour the inner muscular fibres of the cervix and those of the adjacent portion of the uterus are drawn upwards under the influence of uterine contractions, gradually obliterating the cervical canal, leaving only the external os and the surrounding thinned-out cervical tissue. Schuman claims that dilatation is due to the manner in which the muscle fibres of the uterus as a whole are arranged, in that those at the level of the internal os run horizontally in a circular manner around the organ, and that into these are inserted the longitudinal and oblique fibres of the upper segment, so that the latter exert an upward and outward action upon the lower segment, pulling it against the resistance of the fetal head, and as the lower uterine segment is of comparatively poor musculature and is rendered periodically ischæmic by pressure against the head, it thins out and is slowly pulled upward over the presenting part which at the same time is being thrust downward by contraction of the upper segment. Shears holds much the same view and says that dilatation is due to an intrinsic function of uterine muscle. The one or two fingers of cervical dilatation prior to the onset of labour is likely due to the Braxton Hicks contractions which are sometimes accentuated as term is approached. Jeffcoate¹⁰ states that "The behaviour of the upper uterine segment is closely related to that of the lower segment of the cervix. Expulsive contractions of the upper segment result in dilatation of the cervix and vice versa."

From these evidences it would therefore appear that dilatation of the cervix is brought about by muscular action of the uterus effacing and retracting the cervix over the presenting

part, the bag of waters playing an insignificant part, if any, in the process. The manner in which the cervix is retracted over the presenting part is favoured by a presenting part which fits accurately the lower uterine segment. Any interference with this relationship not only retards dilatation but leads to inefficiency of the uterine contractions. Hence not only is the head a better dilating agent of the cervix than the breech, but so also do anterior positions of the occiput, where flexion is more often maintained than in posterior positions, favour dilatation.

It is generally recognized that the main factors causing delay in labour—namely, primary inertia and occipito-posterior positions frequently are associated in the same case, and that with this association the membranes often rupture early in labour before the cervix is dilated. It is difficult to explain this early rupture of membranes in a given case, but it may be taken as almost an axiom that when in the presence of a posterior occiput position the membranes rupture early there will usually be a primary inertia as well. This is especially true if the head does not fit well into the lower uterine segment.

Here there is not a matter of disproportion *per se*, as this is frequently absent, but rather of three factors: (1) inco-ordination of uterine muscle action; (2) endocrines; (3) chemical.

The uterus is essentially a bilateral organ in origin, being developed from the two Müllerian tracts. Failure in the development of one-half, or failure of the co-ordinating mechanism, will lead to an irregular, partial, or feeble contraction, or to an asynchronous contraction in the two halves of the uterus, resulting in the prolongation of labour. The existence of a co-ordinating mechanism in the human uterus seems obvious, even though little is known regarding its nature. According to Rudolph and Ivy¹¹ it may be neurogenic, myogenic, hormonal or some combination of these.

It is generally believed that the extrinsic nerves may play a part in the activity of the uterus in labour; it must not be forgotten that labour can terminate spontaneously after severance of the lumbar cord. Less is known regarding the intrinsic nervous mechanism, although Fleming has produced evidence of such a mechanism in the presence of a network of nerve fibres in the uterine wall, but found no nerve cells comparable to those in the sympathetic ganglia. Hoffbauer's¹² work would seem to sup-

port a myogenic or neuromyogenic co-ordinating mechanism, in that he found the existence of fibres in the uterus analogous to the Purkinje fibres of the heart.

Recent work on the endocrines seems to show that they are of considerable importance in determining the behaviour of the uterus; not only are they of importance in the preparation of the uterus during pregnancy but are responsible for the onset and maintenance of uterine contractions. Animal experiments show that of these the oestrogenic hormone is the more important, as oxytocin is ineffective in the absence of an oestrogen. Jeffcoate, in the Blair Bell Memorial Lecture on uterine inertia, obtained successful results in 56.8 per cent of cases by the administration of oestrogens. He further claims that "whether the inertia was primary or secondary the results of treatment were similar (in both groups), and that the response to oestrin does not bear any relation to the time of onset of the inertia nor to the stage in labour at which treatment is commenced". He advised intramuscular injections at hourly intervals for 8 or 10 hours, the amount injected depending upon the preparation used.

The effect of calcium on uterine muscle was first observed by Blair Bell, and in 1915 he expressed the view that the reduction of blood calcium below an optimum level might be a factor in the causation of primary uterine inertia, advising its administration during the last trimester of pregnancy as a prophylactic. Danforth and Ivy¹⁸ in a series of animal experiments have shown that calcium plays an essential rôle in the motor activity of uterine muscle. When deficient in proper amount uterine muscle is not only inactive but is refractory to oxytocics. They reached the conclusion (1) that calcium is necessary for the maintenance of tone, contractility, and co-ordinated activity of the post partum uterus of the dog and rabbit; (2) that the action of oxytocics is potentiated by calcium; and (3) that doses of oxytocics adequate for uterine response are ineffective when the available calcium is diminished.

Primary inertia as a cause of delay is best managed by (1) a careful estimation and determination of any associated mechanical factors and their correction if and when possible; (2) the control of pain and the promoting of rest by the use of morphia to a degree compatible with the safety of the child. It is my experience

that morphia far exceeds that of any other single drug in combating uterine inertia; (3) the maintenance of a proper fluid intake either by mouth or intravenous therapy is important. The use of alcohol in the form of whiskey should not be lost sight of; (4) finally, the administration of oestrogenic substances and calcium.

It must not be forgotten however that much can be done by education of the woman during pregnancy to a wholesome attitude towards labour and by the removal of fear, because it is recognized that there is a psychological factor present in many cases of inertia. The use of oxytocic substances is as a rule of little value and not without danger.

Primary inertia associated with mechanical factors becomes a greater problem, and of these the most common is that of the posterior occiput position. While many writers claim that some 80 per cent of posterior occiput positions undergo spontaneous rotation and delivery if given sufficient time, it is within the knowledge of all that the association is perhaps the most frequent reason for interference and operative delivery.

It is not my intention to discuss the various methods which have been advocated to terminate labour under these conditions, or to advance one method over all, but rather to keep before you the importance of early recognition of this added mechanical factor and to remind you that attempts at delivery before complete dilatation of the cervix are fraught with grave risk to the child and the mother. A frequent hinderance to cervical dilatation and progressive advancement of the fetal head is a contraction ring. The combination of this triad—primary inertia, posterior occiput position, and an internal contraction ring—is by no means an occasional occurrence; on the contrary it is extremely frequent. An attempt at delivery without taking cognizance of this possibility seriously endangers the life of the child and often leads to severe injury to the maternal tissues. The triad mentioned is often the cause of failure in attempts at forceps delivery by preventing the forward and downward movement of the shoulders, for as long as the shoulders are unable to move forwards so must the rotation of the occiput fail to occur. Therefore, before attempting delivery the presence of such a ring should be determined and its dilatation obtained. It is my experience that this is

best done by means of chloroform anæsthesia and manual dilatation, and this is usually successful provided the condition has been recognized early. Drugs have seldom proved of any value, and gas anæsthesia usually does not produce the required relaxation.

In conclusion, then, delay in labour is primarily the result of (1) uterine inertia (chiefly primary); with the secondary type of inertia the treatment is obvious; (2) uterine inertia associated with the posterior occipital position. Treatment again can only be logically sound if based on early recognition of these factors. Failure of dilatation of the cervix is often associated with an internal contraction ring situated around the child's neck about 8 cm. from the margin of the external os.

The cessation of dilatation at the half or three-quarters stage in the presence of a posterior occipital position is usually found to be due to a contraction ring as described.

In instances of partial dilatation with lack of progress it seems obvious that unless the inertia can be overcome operative delivery is

necessary. It is here, however, that the utmost care and judgment should be exercised. Many obstetricians advocate the use of a hydrostatic bag in such cases; others advise incising the cervix (Dührssen's incisions) but it seems to me that incision must usually fail to accomplish all that one desires in the presence of a contraction ring, as it is not possible to incise such a ring from below without entering the pouch of Douglas or seriously risking injury to the bladder. Manual dilatation offers the best hope.

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THE RECOGNITION OF LATE TOXÆMIA OF PREGNANCY IN ITS INCIPIENCY*

By H. F. DYER

Hamilton, Ont.

PHYSICIANS practising obstetrics are forever confronted with the problem of late toxæmia. The importance of this disease during the latter part of pregnancy becomes apparent when we consider that 10 per cent of pregnant women show some signs of toxæmia (Stander and Peckham), and that one-third of the total maternal mortality is directly due to late toxæmia. Peckham and Stout have demonstrated also that 50 per cent of women who suffered from toxæmia, when examined five years later, showed some signs of chronic arterial disease or chronic nephritis.

Late toxæmia is usually classified as follows: (1) the non-convulsive toxæmia or pre-eclampsia, mild and severe; (2) convulsive toxæmia or eclampsia. Whether the toxæmia is pre-eclampsia or eclampsia it is agreed that the process is one of degree and not of a different kind, but the term eclampsia is reserved for those cases

in which convulsions occur. The toxæmia is recognized by four main signs, viz., (1) hypertension; (2) albuminuria; (3) œdema; (4) convulsions. We watch for these signs and on their first appearance, institute treatment which consists, among other measures, of increased rest, reduced salt-free diet, sedation, etc. Sometimes we are able to carry the pregnancy along to its natural termination. The fact still remains that a large percentage of these cases steadily progress and we are obliged to terminate the pregnancy in the interest of the mother and the child.

It would appear then that when hypertension, albuminuria, and œdema are found, even in their earliest stages, the toxæmia is fairly well advanced and perhaps they represent late signs of disease rather than early. They probably make their appearance only when organic changes in the various organs have taken place and in the majority of cases remain fixed or progress in spite of treatment.

* Read at the Hamilton Academy of Medicine, March, 1939.

With this thought in mind, I set out four years ago to determine if there were not earlier signs of toxæmia than these, and gathered the following information. (1) Accosta and Sisson and others have presented evidence that vascular damage is the basis of the pathological changes in the liver, kidneys, brain and heart. (2) Addis, Herrick, Irving and others have agreed in recent years that the effect of the eclamptic toxin on the body produces a spasm of the arterioles throughout the body which in its earliest stages is functional, but if continued over a period of time organic changes occur in these arterioles and thus the organs are affected. (3) Best and Taylor observed that the first sign of kidney disease is the increase of night urine over day urine, and that this occurs long before the presence of albumin or hypertension. (4) Mussey and Mundel, by examination of the retinal vessels, and observing the changes in these during toxæmia, state that these are a distinct guide in the management of these cases.

Therefore, if the factor producing the toxæmia affects the body primarily by a generalized spasm of the arterioles this should very early disturb the function of the kidney because of its profuse arterial supply, and if Best and Taylor's observation is true we should get an increase of night urine over day urine before the presence of hypertension, albuminuria and oedema.

I had my patients collect and measure the day and night urine during the period of their pregnancy, observing only the ratio of the day urine to the night, and not the total volume passed.

The patients in whom the day urine is more than the night and in whom this ratio holds true throughout their pregnancy are in no danger of developing toxæmia.

The patients in whom the night urine becomes more than the day at any period of their preg-

nancy, and in whom this ratio holds true, are in danger of developing toxæmia. In this group a period of from six to eight weeks elapsed before the recognized signs of toxæmia became apparent. Therefore, by using this ratio one can recognize the patients who are developing toxæmia several weeks before the appearance of the present accepted early signs of toxæmia. When the patients in this group are given large doses of vitamin C, the day urine once again becomes more than the night, and the danger of developing toxæmia is apparently eliminated.

Two hundred and fifty consecutive cases have been studied, with 5 pre-eclampsics, all primiparous, and all five showed the night urine more than the day. Now, all those showing an increase of night urine over the day urine are given vitamin C, which corrects this condition and apparently prevents the development of toxæmia.

CASE ROUTINE

Each patient is put on a high vitamin diet (diet slips supplied*) and is not to overeat during the last two months. She is instructed to drink four glassfuls of fluid in the forenoon, and four in the afternoon, outside of meals, and to measure the urine output as follows (once a week only).

Empty the bladder at 8 a.m. and discard the specimen. Collect and measure in ounces all urine during the day, including the specimen at 8 p.m. This is the day, 12 hours. Keep this total amount separate.

Continue to collect and measure all urine during the night, including the specimen at 8 a.m. This is the night, 12 hours. Keep this total amount separate.

The bladder must be emptied at 8 a.m., 8 p.m. and again at 8 a.m.; otherwise whenever necessary.

Salt is restricted only in the last two months.

* Diet sheets supplied by Mead Johnson & Co.

Little touches of human kindness, strict and constant attention to the patient's mental welfare, will do much to rob our clinics and our hospitals of their cold, institutional atmosphere, which frightens so many of our diffident patients and interferes with many a satis-

factory recovery—and equally important, such a plan will not only keep many of our patients loyal to our profession, but will win back to our fold many who have deserted us for the cults.—Dr. Donald Guthrie, *The Diplomat*, 1940, 12: 89.

HYSTEROSALPINGOGRAPHY IN THE DIAGNOSIS OF
GYNÆCOLOGICAL AFFECTIONS*

BY J. E. GENDREAU AND O. DUFRESNE

Radium Institute of Montreal

ATTEMPTED for the first time in 1914, the radiological examination of the uterus after injecting an opaque material into its cavity has become a regular routine for many modern gynæcologists. The technique of this radio-diagnosis with lipiodol or with skioldan-acacia is simple and harmless, with no other contraindication than acute infections, very abundant hæmorrhages, or possible pregnancy.

The radiological aspect of the normal uterine cavity is that of a triangular shadow with a superior base and inferior apex, limited by a slightly curvilinear outline. Tubal canals filled with opaque material give filiform shadows, which start from the superior angles, are curved downwards, enlarged, and, finally, are continued by the intra-peritoneal lipiodol depots.

The morphological modifications of the uterus and tubal canals are the most important ones we have to deal with. *Chronic infections* which alter the muscular wall together with the mucosa give a widened and festooned outlined triangle and black wires ending by sacculated dilata-tions. *Acute infections* which deeply alter the mucosa partially or completely obliterate the lumina of the tubes. *Tumours* outside of the uterine cavity change its topography but never give enlarged shadows as do tumours of the walls. *Intra-tubal tumours* always obliterate the lumen of the tubes, while *intra-uterine tumours* give irregular outlines, different with every kind of tumour.

INDICATIONS OF HYSTEROSALPINGOGRAPHY

This method is utilized: (1) in hæmorrhages, to search for the causes which ordinary gynæcological examination does not reveal; (2) to discover the origin of sterility and locate the situation of its lesion, and to guide its treatment; (3) to specify the etiology of genital pains with no apparent cause; (4) finally, to establish the differential diagnosis of pelvic tumours.

Metrorrhages.—The metrorrhages in women

near the menopause have various causes. The equation, metrorrhagia equals cancer, is no longer right, since we know that 70 per cent of metrorrhages at the menopause have functional causes. So, hysterectomy ought to be cautiously utilized for these troubles, now that the ambulatory and painless radiological treatments constitute the best method of all.

Hysterosalpingography is also indicated in cases of polypus where dilatation of the cervix and resection of the polypus are adequate—in cases of retained placenta, where simple curet-tage is sufficient, and in simple hydrosalpinx where unilateral preservative salpingectomy is indicated.

Among many methods which can establish the etiological diagnosis of metrorrhages, hystero-salpingography is the only one that gives a general view of the whole uterine cavity, without hospitalization, traumatism, dilatation, mobilization of neoplastic cells and perforation; that occasionally permits an immediate surgical decision without biopsy; that can avoid a curet-tage, dangerous to patients with hæmatocele, ovarian cysts, hydrosalpinx; and, finally, that guides the curette towards the prerecognized spot where the biopsy is necessary.

Sterility.—After Pasteur's discoveries we realized the rôle of infection, especially the gonococcal cervical metritis. Now, with hystero-salpingography, we can get a clear idea of the importance of tubal lesions, in sterility, localize them, and plan an appropriate treatment—what we cannot get by any other method.

Genital pains.—Very frequently the most complete general and local exploration does not succeed in elucidating the cause of genital pains. Consequently, by revealing the clinically inconspicuous existence of a spasm, a congenital malformation, an inflammatory lesion, or a neoplastic formation in the uterus, hystero-salpingography furnishes us the most valuable elements upon which our medical judgment can be founded to deduce a right diagnosis and to apply an efficacious treatment.

* Résumé of a paper read at the Seventieth Annual Meeting of the Canadian Medical Association, Section of Radiology, Montreal, June 22, 1939.

Pelvic tumours.—The matter of pelvic tumours is also of great importance, because therapeutics might change according to the stated diagnosis. For instance, it would be a reprehensible conduct to have a woman suffering from her liver, kidneys or heart, operated on for a fibromyoma, while roentgentherapy could clinically cure her with no risk; as it would be a big mistake to irradiate for a long time and uselessly a supposed fibromyoma which really is a chronic cystic salpingitis or an ovarian cyst.

CONCLUSIONS

The radiological exploration of women's internal genitalia, designated as "hysterosalpingo-

graphy", constitutes a valuable method of clinical investigation. It very usefully completes the other gynaecological methods of exploration, (1) to distinguish the functional hæmorrhages from the lesional ones; (2) to establish a causal diagnosis of sterility; (3) to specify the etiology of a pelvic pain with no prominent lesion of the internal genitalia; and, (4) finally, to establish a differential diagnosis of some pelvic tumours.

We can affirm that hysterosalpingography is very valuable in the diagnosis of some gynaecological affections, in which it gives the maximum of results with the minimum of discomfort.

APPENDICITIS*

BY R. M. WANSBROUGH, M.B.

Toronto

MORE than ten thousand articles have been written on the subject of chronic appendicitis and an equally large number on acute appendicitis. This, to me, is a clear indication that the correct procedures in the diagnosis and treatment of the disease are far from settled. In the United States between 16,000 and 18,000 deaths from appendicitis have been reported each year during the last seven. Our percentage mortality in Canada is about the same. The high mortality of this disease will never be reduced to the level of that of a simple operative procedure until every case of appendicitis is treated as a separate clinical entity.

The diagnosis and treatment of appendicitis before rupture, in the normal position and with the customary history, is not difficult. With one exception the appendix should come out immediately, under a suitable anæsthetic and through a McBurney incision. McBurney's approach does the least damage to the abdominal wall. Through it the appendix is most accessible, whether it lies in a retrocecal or pelvic position, and hospitalization of the patient is shorter. If, as is seldom the case, the diagnosis should be wrong, there is no harm in making a second incision if the situation cannot be handled through the original one, but in my experience, this has been necessary in very few instances.

In addition, it cannot do the damage that follows the right rectus and mid-line incisions, where attempts to take out an acutely inflamed retrocecal appendix, or even an appendix not acutely inflamed, have been carried out with resulting peritonitis, ileus from rough handling of the bowel, and infection of the abdominal wound from forceful retraction, with resulting damage to tissue cells and lowered local resistance. These all result in a mortality which is charged against appendicitis. It is far better, if one is doubtful, to open through a right rectus incision and, upon finding the lesion in the retrocecal region, to close this opening and open through the grid-iron.

The one exception to immediate operation in the non-perforated case is where dehydration from vomiting is marked. Few lives have been saved and many lost by immediate operation in such cases. These patients might be described as "sick in the face", and in most instances their condition requires general treatment before they can stand any operation. In addition, I have frequently noticed that if a desperately ill patient be given fluids intravenously or subcutaneously for a few hours the state of his abdomen becomes much less alarming, even to a point where the diagnosis of appendicitis is doubtful, although one may be able to outline a firm dense mass. The latter indicates that the appendix has ruptured and that the patient will

* Read at the 59th Annual Meeting, Ontario Medical Association, Hamilton, May, 1939.

in all probability take care of it himself if given half a chance.

When there is no evidence of a mass, and the general condition of the patient is markedly improved with fluids, it is my impression that the abdomen should be opened. If the appendix has ruptured and is readily found without a great deal of trauma it should be removed, and, if difficult to free, drainage of the peritoneum should be done (usually with a small drain in the pelvis and another where the appendix lay). Frequently, however, one finds that the appendix has not ruptured, though the patient looked extremely ill at the time of admission, and appendectomy may be performed.

When a mass is palpable, Fowler's position, heat to the abdomen, free fluid by mouth, or intravenously if vomiting is present, and a liberal allowance of sedative are all that is necessary. The mass in most cases will disappear, and in three or four months the appendix may be taken out in a clean field. If, on the other hand, the mass does not recede but continues to enlarge, and the patient is not improving in general health, one may occasionally be forced to drain, but the abscess wall which is the main resistance must be preserved by merely draining through a small incision over it.

In my opinion a discussion of the importance of diagnosis is not necessary in the series of cases mentioned. Most of these patients did not see a doctor until a short time before coming into hospital; therefore, mortality in such cases must be charged to the patient or parents of the patient, provided we point out to them, through the press or otherwise, the seriousness of crampy abdominal pain and the fact that it occurs in small children as well as in older children and adults.

The surgeon and the physician have in their charge many cases which do get into trouble. These, in the main, fall into two groups, the retrocecal and the pelvic appendices. In from 60 to 65 per cent of ruptured cases the appendix is in the retrocecal position. Though carefully watched these may rupture, because, though the history was fairly typical of appendicitis, all the examining was done in the front of the abdomen, despite the fact that the point of tenderness was in the loin. When the appendix is in the pelvic position, the patient, though his history is otherwise typical, will often complain of frequency with burning at the end of micturition, and as

the disease progresses a few pus cells are to be found in the urine. Should the appendix be in close proximity to the rectum there will usually be a complaint of diarrhoea; this is actually tenesmus due to irritation of the rectal wall. These cases will not be missed if a rectal examination is made on the physician's or surgeon's first visit.

The most difficult case in which a doctor is forced to make a decision is where appendicitis complicates another disease. In the past few years I have seen several ruptured appendices associated with measles, the typical signs and symptoms of appendicitis coming on just about the time the rash appeared or shortly afterward. In the seven cases with which I have been associated, six were ruptured at the time of examination and the seventh ruptured while the appendix was being removed from a retrocecal position, though the patient's history of pain went back but a few hours. The culture was a pure hæmolytic streptococcus, and the abscess appeared to be in the wall of the appendix. In this group the mortality was high, two out of the seven dying.

There are those cases which I believe are best grouped under the heading of "recurrent appendicitis". I do not like the term "chronic appendicitis", as it indicates constant trouble. Recurrent appendicitis to me means intermittent attacks of abdominal pain which are due to faulty emptying of the appendix, congenital bands or kinks, a retrocecal position, secondary factors of scarring, adhesions, and strictures, a direct result of single or repeated attacks of mild inflammation.

This group as a rule has a history of at least one previous attack of epigastric or umbilical discomfort, which later localized into tenderness or mild throbbing in the right lower quadrant or retrocecal position. As a rule there is loss of appetite and constipation but no elevation of temperature or white blood count. If left to themselves, such patients might recover from one or two attacks, but will eventually develop the acute disease if the appendix be not removed. The thin viscerototic individual with a long, blue, boggy cæcum and ascending colon, with constant discomfort in the right lower quadrant, is not relieved of his symptoms by appendectomy.

Surgical interference in a patient with congenital bands about the cæcum and terminal

ileum only serves to leave a large raw area to which the small bowel may become adherent. This is a common cause of intestinal obstruction, a condition which never arises in this area if the afore-mentioned bands are left untouched. A Meckel's diverticulum, some subacute intestinal obstruction about the band of a Meckel's diverticulum, or an intra-pelvic lesion in the female may produce symptoms similar to a recurrent appendicitis. It is my custom to search for these in all such cases, and also where no adequate cause for an acute intra-abdominal condition is found in the appendiceal region.

Any further reduction in mortality must rest with careful post-operative treatment. Many patients are lost by too diligent as well as by too casual treatment. Rest, the most beneficial of all remedies for a great many diseases, is equally helpful to the post-operative patient. Adequate sedative is necessary and the fluid balance must

be maintained. Vomiting and gastric distension must be controlled with the use of the intra-nasal duodenal tube and the patient placed in Fowler's position when he becomes conscious. Heat to the abdomen and a rectal tube should be used with discretion. Repeated catheterizations may produce cystitis, and repeated bowel stimulants, blood analyses, and exhausting enemas are to be condemned. One must recall that a great many hearts play out because of too much work.

In conclusion, the mortality of appendicitis will not decrease until several main principles are adopted; first, education of the public; second, early diagnosis of the disease with special emphasis on the retrocecal and pelvic appendices; third, the least possible surgical trauma; fourth, conservative treatment of the perforated appendix; fifth, adequate treatment of dehydration; and sixth and last, adequate but not strenuous post-operative care.

THE TREATMENT OF CARCINOMA OF THE COLON

By R. V. B. SHIER, M.B., F.R.C.S.(C.)

Toronto

THERE are always three important considerations when dealing with carcinoma of the colon—first, the very high incidence of complete or partial obstruction when the patients present themselves for relief; second, the highly infected nature of the left large bowel and the presence of tissue infection in and around the malignant area; third, the precarious blood supply, sufficient in health, but very vulnerable to operative trauma, and in the recto-sigmoid region inconstant in quantity and distribution. These factors have been responsible for the persistent effort on the part of surgeons to overcome these difficulties, the result being stage operations. This change in management has been taking place over a period of from fifteen to twenty years, and to such an extent that the incidence of operability and curability has been pushed upward and the operative mortality rate downward, as is seen in a hospital death rate of 20 per cent or more falling to about 5 per cent. This denotes healthy progress and shows the advance of modern surgery. It is to direct attention to these essentials in technique now adopted in

order to ensure these results that this short paper has been written.

As stated, practically all patients suffering from the disease are more or less obstructed when they come for help, and that is, then, the immediate problem. There should be no difficulty in readily deciding that the obstruction is one of the large bowel and not of the small bowel, as the history, physical signs and symptoms are entirely different, in that they are essentially two different entities. If one requires more help a flat x-ray plate and a barium enema will give further aid, but it is necessary to realize that the importance of the barium enema is to point out the site of the obstruction and not necessarily to demonstrate the carcinoma. The forcing of barium through the narrowed lumen, if such is possible, to demonstrate the character of the lesion, is not free from danger in that the trapped barium hardens and is most difficult to dislodge subsequently. Surgeons should not insist on a demonstration of the lesion, for all that is of real interest at this time is the site of the ob-

struction. The lesion, if it is carcinoma, is only of secondary importance.

With the diagnosis of an obstructive lesion of the colon confirmed, what is the first step to be instituted to give relief? Only one thing—a decompression of the bowel by means of cæcostomy. Cæcostomy is a simple procedure and was suggested first in the 18th century, to be exact, in 1710, by Littré, but the operation was not actually performed until 1886 by Pilon. The operation relieves the obstruction, decompresses the bowel, and is a life-saver. It gets the patient out of the acute emergency by relieving his obstruction and rescuing him from the threat of perforation, and by relieving the distension of the proximal bowel allows for subsidence of oedema at the site of the lesion. It also affords a means to institute cleansing irrigations and oil instillations. These are its benefits, but, there are certain things to be remembered about a cæcostomy. First, it is not a defunctioning operation, only a decompressing procedure. Second, there are certain cases of impaction where no amount of oil instillation and irrigation will rid the bowel of putty-like faeces, and, third, inasmuch as it does not defunction it is only of limited value in quieting infection.

The blind cæcostomy is, as a rule, opened by cautery at the end of 24 hours. From that time until the time of radical attack on the carcinomatous lesion attempts are made to get the patient into the pink of condition. The length of time required for this will be from two to three weeks. Here definite rules cannot be laid down, it being necessary to judge each individual case on its own merits, and oftentimes the total value of the decompression cannot be properly assessed until the abdomen has been opened and the actual lesion inspected. Recently, to further enhance the benefits of cæcostomy, sulfanilamide in one of its various forms has been given from four to five days preceding the radical operation in the hope of further combating tissue infection in and around the tumour. This measure seems to be of value.

We are now at the point where one may consider the type of radical removal. This decision is influenced by the site of the lesion and the pathological condition found upon opening the abdomen, and at this time I would like to say the presence of a metastasis in the liver should not negative an attempt at resection. Such

patients, following resection, may carry on comfortably for a year or more and with a very much better existence than if the primary growth had been left *in situ*. Extensive secondaries, of course, would influence this judgment. As far as the growth itself is concerned the surgeon must be prepared to answer four questions. First, is the tumour operable for cure? Second, is the tumour operable for palliation? Third, is the tumour inoperable? Fourth, can it be made operable? In order to answer these questions the operating surgeon must realize what he can successfully attempt technically, and that he must have a first-hand knowledge of the time and place for at least three operative manœuvres; first, Mikulicz resection; second, resection with end-to-end anastomosis by suture; third, a Devine defunctioning colostomy. It is important not to make up one's mind what is to be done until exploration helps to decide the procedure best suited for the individual case.

The Mikulicz method of resection is enjoying high favour at the present time as it appears to carry a greater degree of safety than an end-to-end suture and does not jeopardize the circulation of the segments if performed carefully. There are certain definite indications for this resection, first, as a primary operation where cæcostomy has not been done; the segments to be resected must be mobile or lend themselves to free mobilization; a bowel lumen which has failed to clean and is still filled with faeces. These are very definite indications. In doing this operation care must be taken not to encroach on the marginal artery too closely, as it is essential to preserve an adequate blood supply up to the point of resection, else sloughing results, making difficult attempts at later closure. It is wise to have one inch of bowel protruding beyond the skin level after closure. The clamping of the spur is best attempted about seven to ten days after operation and the length of time for pressure necrosis to be complete is approximately one week, thereby establishing continuity of the faecal current. It has been said that a certain percentage of Mikulicz colostomies close of themselves, but such has not been my good fortune, surgical closure having always been necessary. It is wise, however, to wait until all oedema has subsided from the subcutaneous tissues before attempting closure. The cæcostomy and the

Mikulicz colostomy may be closed at the same time, concluding the case as a three-stage procedure.

There are times when such a procedure cannot be carried out, and end-to-end suture is the method selected. The transverse meso-colon may be too short to allow of mobilization. In cases of transverse colon carcinoma perforating into the stomach, or in cases where a portion of the stomach is to be removed, then an end-to-end suture should be adopted. In a case of splenic flexure or descending colon carcinoma, if end-to-end anastomosis has been decided upon, it is wise to resect from the mid transverse to the sigmoid to ensure a good blood supply. It is also indicated in certain sigmoid carcinomas where sufficient mobilization cannot be accomplished. End-to-end anastomosis is quite satisfactory in any case, no matter where, if the proximal and distal segments of the bowel are similar in calibre and if there is not too much œdema and hypertrophy on the proximal side. The same rules for preservation of the blood supply hold as in the Mikulicz procedure.

Thus far the plans for attempting to cure patients have been directed towards the uncomplicated carcinomas. Unfortunately, there is a complicated group. Some have perforation with localized abscess formation. Others are so adherent, due to inflammatory change, to vital structures such as the large blood vessels and the ureter that resection is hazardous, if not impossible. Others have developed fistulæ. These complications and others bring up the question as to whether or not some procedure may be adopted offering hope for them, if given defunction and rest so that the involved area may be more amenable to resection. This is where a defunctioning colostomy comes in for consideration, and it seems definite that the method advocated by Sir Hugh Devine, of Melbourne, Australia, is the procedure of choice. It fulfils the following requirements: it completely defunctions; it is always placed in the transverse colon where it is sufficiently removed as to be out of the way when later radical operation is attempted; and restoration of the bowel continuity is not a major undertaking. It may be regarded as the most important single achievement in recent times in extending the operability and possibly the curability of these complicated cases, and in extending the limits of

low sigmoid and recto-sigmoid resection in the attempt to preserve the rectum. The defunctioning not only gets rid of the faecal contents, but, by irrigations reduces the bacterial content of the distal colon to such an extent that liberties may be taken in operating hitherto considered unjustifiable.

The ideas expressed here are the result of the conclusions arrived at over a period of a few years and are based on the observations and study of 155 cases of carcinoma of the colon and rectum. Of these 155 cases 101 were of the colon, being distributed from the cæcum to the recto-sigmoid. It is interesting and gratifying to know that while there were 7 deaths in the first 39 cases there were only 3 deaths in the last 62, a drop of from 18 to 5 per cent in hospital mortality. It is evident that progress in the right direction has been made and this is due almost, if not entirely, to more careful consideration of the pathological process present in and around the tumour.

An analysis of the 10 deaths shows that 7 were from peritonitis. In one of these the peritonitis was due to undue haste in closing the cæcostomy following end-to-end suture. A perforation developed when the safety valve was closed and death resulted. A second was the result of attempting a resection of the sigmoid in the presence of perforation. To-day we would defunction this case and wait for a more favourable time. Of the remaining three deaths, one was from pulmonary embolism, one from post-operative pneumonia, and one from sloughing of one limb of the Mikulicz resection, resulting in peritonitis.

One cannot be dogmatic as to whether the ultimate curability has been much improved or not. In a follow-up analysis taken some months ago we came to the following conclusions. Of all the cases coming to operation 40 per cent could be classed as inoperable for cure when they presented themselves for relief. Of the balance, 60 per cent, about two-thirds, or 40 per cent, of all cases could be considered cured at the end of a five-year period.

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Case Reports

A CASE OF MALIGNANT DUODENAL ULCER

By D. N. MACCHARLES

Medicine Hat, Alta.

The patient was a man of 53, a contractor. The complaints were, anorexia, three months; inability to retain solid foods, two months; pain in epigastrium, two and one-half months; loss of weight, two months.

History of present illness.—Just before sitting down to New Year's dinner, January 1, 1939, the patient had a sudden feeling of nausea and loss of appetite. He did not eat his dinner. From then on he experienced a great feeling of fullness and indigestion on eating a normal amount of food. After about two weeks he began to have a rather severe gnawing in his epigastric region, which did not radiate. This pain was somewhat relieved by the taking of milk.

By the end of the month he abstained from eating solid foods due to the fact that about two hours after eating such he would have an emesis of partially digested food. Shortly after this he began to notice a loss of weight and he says he has lost forty pounds in the last two months.

No serious past illnesses. He took alcohol occasionally, and smoked moderately. He used no laxatives. No history of cancer, tuberculosis, syphilis, heart disease, or nervous disorders.

Physical examination.—The patient was five feet tall and weighed 90 lbs. He was very weak and short of breath, both with and without exertion. Had never noticed any oedema of lower extremities or face. The bowels moved regularly every day and he did not take laxatives.

Other systems: No complaints.

General: The patient was a moderately well developed, very thin male, appearing to be somewhat younger than the stated age. He was very pale. Co-operation and mentality good.

Heart and vessels: Pulse 110, regular; tension and volume good; easily compressible. Vessel wall not palpable. Blood pressure 140/90. The heart showed slight enlargement to the left but nothing else of note.

Abdomen: Moved well with respiration. No visible masses, scars or other abnormality. Slightly distended in epigastric region. Liver, spleen and kidneys not palpable. No palpable masses. Hernia sites negative. Inguinal glands not palpable. Some tenderness on palpation over pyloric area. Percussion revealed nothing abnormal.

Other systems: Nothing abnormal found.

X-ray reports of gastric series (by Dr. S. F. McEwen).—The waves were at times active and then at times entirely absent. The duodenum was not well seen. At five hours: Half of the barium still in stomach. At ten hours: Still a great deal of barium in stomach. At twenty-four hours: Still considerable barium in stomach. More barium was given, but it would not pass freely through the duodenum. There is definite obstruction.

Laboratory reports.—Urinalysis: absolutely negative; red blood count: 2,312,000; white blood count: 5,950; hgb.: 29 per cent; colour-index: 0.63. Gastric analysis: total acidity, 63; free acid, absent; lactic acid, present; material obtained had a putrid odour.

Progress.—The patient was given digitalis, tonics, and two blood transfusions. After some time it was decided that he was in as good condition for an operation as was possible and on April 8, 1939, he was taken to the operating room.

The operation was done under a local anæsthetic. A mass the size of a small grapefruit was found in the region of the pylorus. Due to the patient's condition it was decided to do a posterior gastro-enterostomy and return him to the ward.

The patient ran a rather septic temperature for a week and was in rather poor condition, but following this his condition began to improve rapidly. It is worthy of note that at no time during his recovery did he have an emesis nor did he require a gastric lavage. On leaving the hospital, April 30, 1939, his red blood count was over 3,000,000, hæmoglobin 40 per cent, and he weighed 100 lbs. Recommended he return later for gastric resection.

On May 15th, x-ray showed the following: Stomach filled well. No defects seen. The gastro-enterostomy did not function for about half an hour, but then functioned freely. Stomach empty in three hours. In 10 hours all the barium was in the colon.

On June 2nd gastric resection was performed. At this time he weighed 125 lbs. and felt well. The red cells were 3,000,000 and the hgb. 57 per cent.

On opening the abdomen it was found that the mass observed when the first operation was performed, had almost entirely disappeared. The only pathological finding was a rather large ulcer on the first part of the duodenum near its junction with the second part. After a brief consultation it was decided to carry on the original plan of resection of the pyloric end of the stomach and the first part of the duodenum.

It was decided that the original mass was purely an inflammatory reaction due to irritation of the ulcer.

The pathological report from the Provincial Laboratory at the University of Alberta was as follows:

"Distal end of stomach and proximal portion of duodenum about 4 cm. from the pylorus is a deep ulcer about 1.5 cm. in diameter with heaped up edges.

Sections through area of ulceration in duodenum show invasion of base of ulcer by rapidly growing masses of epithelial tumour cells in a typical glandular arrangement. The tumour cells have broken through the muscularis mucosæ and are about to penetrate the circular muscle. The whole of the wall of the duodenum shows a marked inflammatory reaction with infiltration by many polymorphonuclears, lymphocytes and eosinophiles. This is the first malignant ulcer of the duodenum that we have encountered.

Diagnosis: Infected carcinomatous ulcer — duodenum."

The patient made an uneventful recovery and was discharged from the hospital June 24th, in an improved condition.

On January 12, 1940, the patient reported that he had been working since August 1, 1939. He said he weighs 116 lbs., takes food six times a day, the bowels move regularly, and he has had no pain of any kind.

I am indebted to Dr. Hector McFadyen for compiling the history of this case.

AN INTERESTING CASE OF HERPES

BY IRVIN WEISSTUB, M.D., L.M.C.C.

Port Arthur, Ont.

The patient was an elderly woman, aged 65 years, suffering from chronic rheumatism with ankylosis. She developed an attack of chills, general malaise with prostration, and severe neuralgic pains in the left lower extremity, extending from the left hip to the ankle. Her temperature on examination was 100.0°.

On the third or fourth day she noticed an eruption on several skin areas. Examination revealed a series of herpetiform vesicles in groups on an erythematous base, located on the buttock, the inner side of the thigh and ankle. On palpation the pain and tenderness followed the track of the sciatic nerve and its branches.

In my experience, as well as in the standard authorities, herpes zoster is usually confined to one side of the face, and, while herpes may occur on the extremities, it is rare to find it below the elbow or knee. This case is of interest because of the unusual distribution, being confined to the area of distribution of the sciatic nerve.

The patient was treated successfully with mild doses of salicylates, with codeine for pain, as well as vitamin B₁ (ryzamin B, B. & W.). Locally the eruption responded favourably to a dusting powder:

R Pulv. acidi acetylsalicylici gr. x
Pulv. zinci oxidi drachms iv
Pulv. talci venet. ad oz. i

I have found drying soothing powders to be the most satisfactory form of local medication in herpetiform eruptions.

Clinical and Laboratory Notes

AN IDEAL TECHNIQUE FOR CLOSURE OF LAPAROTOMY INCISIONS ESPECIALLY APPLICABLE IN CLEAN APPENDIX OPERATIONS

BY W. H. IRVINE, M.D.

Fredericton, N.B.

It is the writer's belief that one is not often justified in inflicting long initial abdominal incisions, nor of trans-severing muscles, unless for certain definite reasons, to wit, rigid abdomen, vomiting, inordinate temperature, leukocytosis, etc., indicative of fulmination, concerning which no surgeon requires further comment.

For a goodly number of years, I have used the shortest possible initial incision, that is (unless in a very fat patient) about 1½ inches in length, corresponding to the course of the fibres of the external oblique, which fibres are separated in the usual manner by the end of any suitable instrument and retracted along with the skin and superficial fascia, thus exposing the internal oblique, which is likewise fibre split and retracted; then the transversalis is retracted, exposing the subperitoneal fat and entering the parietal peritoneum. The gloved finger is now gently introduced, employing gentle palpation, and *avoiding the entrance of gauze within the abdominal cavity*. If blessed with long fingers you have an advantage. The index should be able to detect gross lesions, and the band of the ascending colon will lead you to your quest, which, of course, is dealt with. Personally, I no longer use the purse-string inverted stump, and if the meso-appendix is broad I like to cover any raw exposure with fine gut approximating the peritoneal residue of the same. Of course it may become necessary to depart from this technique to enlarge the opening; this is however (in such instances) very seldom necessary, and here is where Drs. Experience and Conscience are the safe counsellors. Personally I have

never had occasion to regret this method, with 100 per cent good recoveries, and sound abdominal walls. Please remember I am speaking of unruptured, non-complicated cases of appendicitis, though some were very near the "blow out" point. The reader will note that

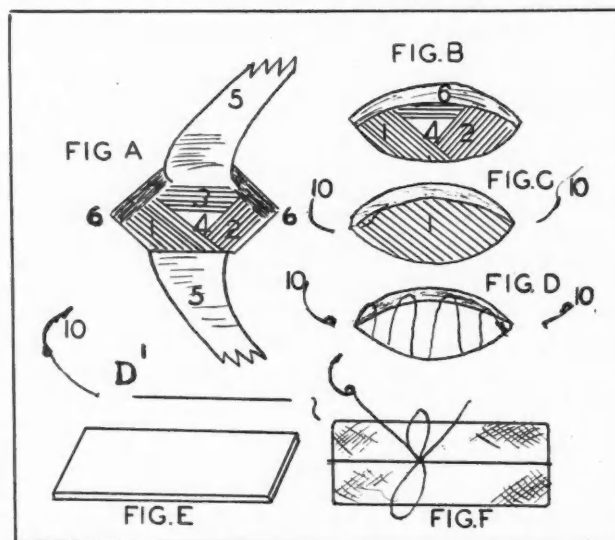


Fig. A.—(1) Indicates the course of muscular fibres of external oblique; (2) fibres of internal oblique; (3) fibres of transversalis; (4) subperitoneal fascia; (5) retractors. **Fig. B.**—Same as A except that 6 marks the skin and subcutaneous fascia. **Fig. C.**—The same as other numbers with 1 showing the course of the muscular fibres of external oblique, before and after splitting same have contributed to the technique; 10, to the right of the incision—about ¾ inch from right end of incision; 10, to the left, shows point of exit. **Fig. D.**—The same as Fig. C plus passage of subcuticular silk worm gut suture, D1 at 10 shows the approximated lips of original incision when both ends of the suture are pulled taut. **Fig. E.**—The wooden tongue cut relative to the length of such incision, though slightly longer. **Fig. F.**—Same as Fig. E—the tongue is wrapped with gauze (smooth surface next the skin) held taut by bow-knotted silk worm gut. In actual performance, however, the original cut is with the course of external oblique muscle, and this is drawn to more clearly assist visual memory in observing my technique.

the title implies another matter, which will conclude this brief article. The peritoneum is closed by fine absorbable catgut in continuous suture; muscular fibres are approximated by interrupted similar sutures, in layers, while the skin and fascia are closed by the subcuticular "S"—side to side, silkworm gut, used in this manner.

Technique of closure. Using preferably Hagedorn's half-circle-needle, the point is introduced from without, about $\frac{3}{8}$ ths. of an inch beyond the end of the cut, and after passage along the length of the wound it makes its exit, from within the wound outward, about $\frac{3}{8}$ ths. of an inch beyond the other end of the original primary incision. Then a previously sterilized wooden tongue depressor is cut about a $\frac{1}{2}$ inch longer than the wound, wrapped in sterile gauze, the upper surface and ends folded, the lower surface, next the skin, is applied lengthwise of the cut, and the one only silkworm superficial, subcuticular suture is pulled taut lengthwise, thus approximating neatly the incised margins.

On the 8th day the bow-knot of the ends of the suture is untied; at one end of the tongue depressor the suture is cut and pressure is made over the depressor, whilst a sudden pull is made of the silkworm gut suture. Thus all terror of taking the stitches out is overcome. You have an unimpaired abdominal wall, a smooth inner scar, natural approximation of the muscle fibres, and an abdomen devoid of defacement, with the possibility of keloid, hernia, adhesions, painful scars, weak abdominal walls, or "another operation" eliminated, all of which can and does happen, as must be frankly admitted.

The means of closing wounds thus made are very diversified. At one hospital they used silver leaf next the skin; another, gauze wrung out in alcohol; another, freely powdering and covering with gauze and pressure pads, etc. etc. Personally I have used about all of those seen at various places, but I do not believe any simpler and nicer method, at least for appendix cases, exists than this very available method.

Better results in checking dangerous bleeding with vitamin K are promised by new, synthetic K vitamins announced by Drs. E. A. Doisy, S. B. Binkley, S. A. Thayer, R. W. McKee and D. Richert, of St. Louis University. The new anti-bleeding chemicals related to vitamin K can be dissolved in water, whereas natural vitamin K compounds cannot. This means that the natural K vitamins must be taken by mouth, but sometimes the patients needing the vitamin most are so sick they cannot take anything by mouth. The new, water-soluble K vitamins can be injected by hypodermic needle in such cases. The natural vitamin K₁ has previously been isolated and synthesized by Dr. Doisy and associates and they told also about the chemical structure of another natural anti-bleeding compound, vitamin K₂.—*Science News Letter*, 1940, 37: 260.

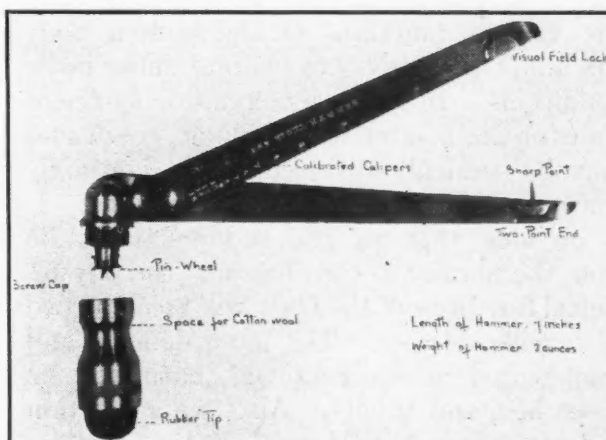
THE MCGILL HAMMER

By HAROLD ELLIOTT, M.D.

*Department of Neurology and Neurosurgery of
McGill University, Montreal*

The McGill Hammer is a compact instrument for testing reflexes, light touch sensation, pain sensation, and two-point discrimination.

It weighs 3 ounces, measures 7 inches, and easily fits into a suit-coat pocket. The head, made of duraluminum, is in two parts. The lower section has a soft rubber percussion tip of standard (door-stop) size, and a compartment for cotton wool. The upper section has a fine steel pin-wheel for testing pain sensation, and fits into the lower compartment. The handles



or calipers are calibrated up to 20 cm. and can be used in measuring the diameter of the heart as well as other things. The ends are designed for two-point discrimination, and the lock has a sharp point for pain sensation.

The hammer was designed in the Graduate School of McGill University after consultation, and fashioned in the Department of Mechanical Engineering.

A great man having been asked why he wore his seal-ring on his left hand, whereas the right possesses so much excellence, replied: "Knowest thou not that the meritorious are always neglected?"—The Sheik Sa'di of Shiraz.

To be proud of learning is the greatest ignorance. It is a little learning, and very little, which makes men conclude hastily.

No man can be provident of his time who is not prudent in the choice of his company.—Jeremy Taylor.

Temperance is a bridle of gold; he who uses it rightly is more like a god than a man.

As threshing separates the corn from the chaff, so does affliction purify virtue.—Burton.

Editorial

PHYSIOLOGY AND AVIATION

THE enormous development of the science of aviation since the Great War has necessitated a reexamination and a recasting of our views in regard to the effect of flying on the human complex. The old problems have become more insistent and new problems have been developed. Man was created a terrestrial being; he has become, prematurely and of his own volition, a celestial one. The difference is great. It should be remembered, too, that, given sufficient time, the various functions of the human body can adapt themselves to operate under novel conditions. In the case of aviation sufficient time for this is often not available, conditions may be suddenly reversed, and accordingly adaptation is imperfect or non-existent. It is obvious that in the sudden transition from the normal to the abnormal the physiological functions of the body will be disturbed in varying degrees. The more delicate and complicated mechanisms will, naturally, be upset first and chiefly. Also, we get action and reaction. Pathological states may develop, and various sequelæ. Think here of the mechanical perfection to which the aeroplane has been brought. In the last twenty years it has become much speedier; it can climb higher, even into the stratosphere; it is more manoeuvrable; it has a great range of flight. We have therefore to reckon with such factors as altitude, temperature, sudden changes of equilibrium, noise, light (glare), vibration, wind pressure, position of the body, mental strain, and fatigue in increased measure. Wonderful as man's power of adaptation is, it seems at the moment as if in the race between man and machine the latter would win out. Accordingly, new standards for fitness have had to be established; new tests for stresses; better methods for meeting dangerous conditions. To meet the new conditions the British Government has set up a Flying Personnel Research Committee to investigate many of these problems, especially those connected with the more efficient supply of oxygen at high altitudes, disturbances of vision, the ill effects of sounds, fatigue, strain, and

examination standards for candidates for the flying corps.

The space available here does not allow us to discuss in any detail the physiological upsets that are due to the pursuit of flying. At most we can only touch the fringe of the many complicated problems that confront us. Those who desire more complete information are recommended to read "Principles and Practice of Aviation Medicine", by Capt. Harry G. Armstrong, Medical Corps, United States Army,¹ who, on the basis of practical experience and experimental research, has produced a book which is well documented and brings our knowledge of the subject well up to date.

An interesting development in the science of aviation that should not be overlooked is the parachute. This is employed for various purposes, all of them of first class importance,—such as providing a means of safety when an aeroplane is shot down or otherwise incapacitated, and to land troops, engineers, mechanics, and spies in an enemy's country. The physical forces that play upon the aeroplane and its crew play also upon the parachute, though to a less degree. They are now being studied as a special problem. Apart from actual gross injury to the body, sustained in the sudden drop or from the impact of landing, we meet with the same finer physiological disturbances characteristic of flying—tinnitus, vertigo, "blacking-out", loss of consciousness, epistaxis, ocular congestion, and headache.

We will now consider briefly some of the more important disturbances of physiological function incident to flying, and particularly in relation to their causes.

Effects of altitude.—In 1862 Glaisher and Coxwell ascended in a balloon approximately to a height of 29,000 feet. The former noted loss of acuity in vision and hearing; paralysis of the legs and arms; and unconsciousness. It has also been noted that heights above 15,000 to 18,000 feet are apt to cause gastro-

1. ARMSTRONG, H. G.: *Principles and Practice of Aviation Medicine*, Williams & Wilkins Co., Baltimore, 1939.

intestinal distress from expansion of gases contained in the bowel.

In the case of what is called "air-sickness", otherwise, acute altitude sickness, the results depend upon the rate of ascent and the duration of exposure, and are due to decreased partial pressure of oxygen. The symptoms are sleepiness, headache, altered respiration, lassitude, and mental impairment. Armstrong calls the condition a true temporary functional neurosis. Air-sickness is a common complaint of civilian passengers in aeroplanes. Persistence in flying tends to overcome the tendency and in time some 80 per cent become immune. Curiously, if the rise in elevation becomes excessive a state of euphoria succeeds, most likely due to a benumbing of the sensorium. A continuation of the rise may end in death, probably because of failure of the respiratory centre.

Chronic altitude sickness is known, due also to lack of oxygen, and may be more serious than the acute form. It is marked by obstinate fatigue and disability, lassitude, sleepiness, lack of initiative, marked irritability, and disregard of danger in the air. It has been suggested, on the basis of experiments by Giragossintz and Sundstroem² and of Armstrong and Heim,³ that the fatigue experienced may be due to adrenal insufficiency. There are no significant changes in NaCl, O₂, or non-protein nitrogen. The pulse rate tends to slow both at sea-level and at 12,000 feet. A slight drop in the systolic and a slight rise in the diastolic blood pressures have been noted. Contrary to the teaching of Fitzgerald, McFarland, Haldane, and Schneider, and many others, recent work has shown that the red corpuscles and hæmoglobin increase as the result of frequent ascents.

Effects of cold.—Chilly sensations are accompanied by increased metabolism and muscular restlessness. Later, acuity of tactile sensibility and muscle reactions is dulled; there is mental distress. Voluntary muscular movements become sluggish, and finally there is tissue destruction, death

occurring generally at temperatures of -25 to -50° F. We note then a graduated loss of efficiency under the influence of cold.

Effects of speed.—Speed in itself is said to have no harmful effect on the body. Still, excessive speed must tend to determine the cells and solid particles of the fluids to parts remote from the entering wedge (on the principle of the centrifuge). This, of course, would be more likely to produce deleterious results in cases where the body is in a horizontal position, as with observers, photographers, and, possibly, gunners and bombers.

Linear and centrifugal accelerations act principally by producing stress, and angular acceleration by inducing vertigo. Armstrong believes that "blacking out" and the coma met with under positive accelerations are due to ocular and cerebral anæmia. The blood pressure falls.

Effects of light.—Too much light (or glare) causes straining of vision, pain in the eyes, and in extreme cases temporary loss of vision, also nervous strain.

Effects of vibration.—These are muscular and nervous fatigue.

Effects of flight on the ear.—Here the conditions that most affect the ear are changes in barometric pressure during ascent and descent, noise, and, possibly, vibration. Changes in atmospheric pressure interfere with the ventilation of the middle ear, producing discomfort, pain, congestion, inflammation, even rupture of the tympanic membrane, followed by temporary or permanent loss of hearing. Continued noise may also cause loss of hearing.

A word about the diet best adapted to aviators. In as much as muscular energy is not called upon greatly and the chief requisite of diet is to maintain bodily heat and energy, carbohydrates are of the greatest value. Experiments have shown that this is true in cases where there is lack of oxygen. A diet which has been recommended for those on a three days' flight includes dried meat sandwiches, chocolate, oranges, apples, bananas, dried dates, dried figs, dried raisins, sugar, chewing-gum, coffee, and malted milk tablets. In fact, a similar diet may be provided in the case of sudden exposure to high altitudes. Such diets seem to meet a number of indications. This is preventive aviation medicine.

A. G. N.

2. GIRAGOSSINTZ, G. AND SUNDSTROEM, E.: Cortico-adrenal insufficiency in rats under reduced pressure, *Proc. Soc. Exper. Biol. et Med.*, 1937, 36: 432.

3. ARMSTRONG, H. G. AND HEIM, J. W.: Effect of daily exposures to anoxæmia, *J. Aviation Med.*, 1938, 9: 92.

Editorial Comments

The Prevention of Adhesions

There is probably no sequel to tissue damage, either traumatic or inflammatory, which gives rise to such difficult problems in medicine as does the formation of adhesions. They hamper the chest surgeon in his treatment of pulmonary tuberculosis; they may be of very grave import in the abdomen by their obstructive effect, and they are the most common factor that the neurosurgeon has to deal with in post-traumatic epilepsy.

A method for preventing the formation of adhesions is therefore of extraordinary interest. A recent paper, based on work done in the Department of Neurology and Neurosurgery of McGill University and the Montreal Neurological Institute, deals with this problem and contains encouraging conclusions.* It is pointed out that head injuries are very much more likely to give rise to epileptic seizures later when the dura is perforated than when it is not, even though the damage to the brain itself be greater in the latter case. It is recognized that the central nervous system, when deprived of its normal covering (as in any tear of the meninges) always becomes the site of marked cellular reaction. The result is scarring and adhesions. The problem therefore is how to prevent these scars. Experimental work on animals was first performed, the brain being subjected to laceration and various materials placed over the injured area. These substances included cargile membrane; fat; aluminium and silver foil; mica; nickel plate; stainless steel; cellophane; fascia lata; plain catgut; allantoic membrane; human amnion and amnioplastin. The results in brief were that only one of these did not produce adhesions, namely, amnioplastin. In general, the animal tissues (fat, etc.) all became built into a new brain covering which replaced the dura and incorporated the pia. Of these materials fat produced the greatest cellular reaction. Silver foil and nickel plate produced more cellular reaction than the thin steel and celloidin. Cargile membrane which is ox peritoneum in dry sterile sheets, and is quite widely used in neurosurgical clinics, gave comparatively poor results, dense adhesions being formed with it.

The amnioplastin is a thin sheet which is easily prepared from the fetal membranes. It is shown that this membrane gradually disappears from the operative site, being completely absorbed in thirty days. In none of the experimental animals were any adhesions formed beneath it and regeneration of the dura took place

at the site. What fibroblasts were formed above and below it were the reaction to a vanishing foreign body.

The authors therefore recommend that amnioplastin be used in the surgical treatment of all injuries to the brain. They also suggest its use in other fields, *e.g.*, about sutured tendons and nerves and in peritoneal and joint cavities. No doubt further experience with it will bring about modifications, but there seems to be enough evidence to regard it as an extremely valuable and readily accessible material in surgery, particularly neurosurgery. H.E.M.

Food for Health in Peace and War

We received, shortly ago, an unpretentious, yet attractive, booklet having the above title. This represents not the least of the many activities of the Canadian Medical Association designed for the benefit of the public at large.

For the medical profession it is a truism to say that health, to some extent wealth, and certainly happiness depend in large measure on a sufficient supply of suitable food. When we are told that in one of the large cities of Canada some 45 per cent of its inhabitants are undernourished, and we doubt not that other cities are in the same case, we ask,—"Can nothing be done about it?" The booklet mentioned is helping to do something about it. No doubt much of the trouble can be attributed to over-crowding, bad air, lack of sunlight—in short, slum-conditions—but all these are dependent in large measure on poverty. Poverty leads to malnutrition and ill health, to loss of working power, and these, again, by a sort of vicious circle, back to poverty. Poverty, again, is aggravated by ignorance of all kinds, including ignorance of the best kinds of food to purchase, ignorance of the best methods of cooking, ignorance of the proper economies, plus wastefulness. Education of the masses, it is hoped, will lead in time to a better situation. These considerations take on an added importance during war time, always a time for forethought and economy.

"Food for Health" contains all the information necessary to plan a menu which will be at once satisfying from the scientific view point and from the view point of economy. It is truly *Multum in parvo*. It abounds in valuable hints. It begins with a short discussion of the "protective" foods. It tells the housewife what to buy. It advises food lists for families of various sizes. It gives the cost of each item. It ends with suggestions for meals, shopping hints and cooking hints. Nothing of moment has been omitted.

* Chao, Yi-Cheng, Humphreys, S. and Penfield, W.: New method of preventing adhesions, *Brit. M. J.*, 1940, 1: 517.

The booklet has been prepared under the direction of the Association's efficient and energetic Committee on Nutrition. The Canadian Dietetic Association has assisted in the preparation of the Food Lists, which have been tested in Canadian families under the supervision of the Visiting Homemakers Association. We thank these ladies for their aid. It is in-

tended to place the booklet in every home in Canada. A million and a half copies have been struck off, and more will follow. Very specially does the Canadian Medical Association wish to record its indebtedness to the Life Insurance Companies in Canada for their splendid assistance towards the publication of this little work.
A.G.N.

Medical Economics

VIII.

THE POSITION OF THE DOCTOR UNDER INSURANCE AND STATE MEDICINE, AND IN OTHER NON-INSURANCE METHODS OF PROVIDING HEALTH SERVICES

BY HUGH H. WOLFENDEN, F.I.A., F.A.S., F.S.S.

Consulting Actuary and Statistician

Adviser on Medical Economics to the Canadian Medical Association

The previous articles have considered mainly two principles by which regularized payments for health services may be arranged, namely, "insurance" and "state medicine". The definitions and features of these methods were discussed in No. IV.

In order to keep clear the distinctions between these two procedures and certain others which will now be examined, it is advisable to recall that "insurance" involves "the co-operative association of a large number of persons, who agree to share amongst themselves the burdens resulting from the occurrence of a particular contingency—such as death, sickness, unemployment, etc.—by the payment of the necessary contributions into a common fund, from which benefits, related strictly to those contributions, are distributed in alleviation of the burdens against which the insurance is effected". In this statement of the insurance principle certain incidental requirements must also be satisfied, namely, (a) the contingency must be capable of definition, understanding, verification, and practical interpretation; (b) the contingency must involve a loss which can be evaluated; (c) the probability of the occurrence of the contingency must be predictable within the limits of variation indicated by the laws of chance, and the contingency must be one which is not likely to occur simultaneously to every member of the insured group, and which will not be influenced unduly by the voluntary acts of those insured; (d) the group must be reasonably homogeneous; and (e) the contingency, the contributions, and the benefits must be clearly defined and understood, so that claims can be investigated, certified, and

controlled to make sure that they fall within the terms and conditions of the plan. Certain practical restrictions also, which likewise are set out in article No. IV, must be imposed before any insurance plan can be certified as being "actuarially sound". "State medicine," on the other hand—whether it covers a whole country or Province, or is established merely as a type of municipalized medicine, Provincially sponsored and supervised, as in some parts of Western Canada (see article No. VII)—implies, in its broadest concept, "a system of medical administration by which the state provides medical services for the entire population, or a large part thereof, and under which all practitioners are employed, directed, and paid by the state, on a salary basis or otherwise".

THE POSITION OF THE DOCTOR UNDER INSURANCE PLANS

For the purposes of these articles especially, it is important that a clear understanding shall be obtained of the position of the doctor and of those others who would be called upon to render services. When the "insurance" method is used, the status of the physician, for example, generally assumes one of two forms. If any individual (not the doctor) becomes a member of an insurance plan—operated by an insurance company, association, or otherwise—through which he is to obtain a direct cash indemnity, either for partial reimbursement of his loss of earnings, or for payment of his medical, surgical, hospital, and other expenses, the doctor usually finds himself in the position of having to certify as to the character and duration of the illness—that certification being scrutinized, of course, by the claims department of the insurance plan in order to verify the admissibility of the claim; and the doctor must look to the individual concerned (not to the officials of the insurance plan) for payment of his account. If, however, the individual joins a plan which gives benefits in kind (medical care, surgery, hospitalization, etc.), the doctor again must certify the illness, and again the certification must be scrutinized and approved—although in plans where the claims officer is a medical man, the doctor finds that his certifications are judged by an informed medical practitioner, instead of by a claims department

which he may sometimes think is not well versed in medical procedures; and the doctor (in these plans which give benefits in kind) looks to the officials of the insurance plan (not to the individual) for payment of his account.

CONTROL OF THE DOCTOR'S CERTIFICATIONS

It will thus be seen that when the benefits are in kind and not in cash, and when the claims administration is in the hands of medical men, the doctor will be assured that any interference with his diagnoses and certifications will be initiated by medical men themselves. That assurance is sometimes held to be one of the advantages of medically-controlled plans like Associated Medical Services (see article No. VII), giving benefits in kind. Those who support this view point out that in some of the European plans much difficulty arose from uninformed lay intervention.

The question then evidently may be asked whether such medical control can be secured when the benefits are in cash and not in kind. This raises at once, of course, the controversial problem as to the type of organization which can most satisfactorily administer those benefits in cash. For it is to be remembered that the insurance companies and societies are there powerfully in the field, with much experience, widespread facilities, and a belief (not shared by every doctor) that their knowledge of lay supervision of the claims, which come from laymen (albeit certified by doctors), should have at least equal weight with medical supervision of the certifications which come from the doctors (although initiated by laymen). When the problem is expressed in that fashion, the solution would appear to lie once more in a joint co-operative effort, wherein the claims administration would be undertaken by experienced insurance laymen and doctors, working with each other. A satisfactory result can hardly be anticipated, therefore, unless the insurance interests concede the paramount knowledge of the medical profession in all purely medical matters, and unless the medical profession also admits that the experienced assistance of insurance men is essential for successful claims administration.

THE NECESSITY FOR CO-OPERATION BETWEEN DOCTORS AND INSURANCE LAYMEN

These matters are referred to here because conflicts have sometimes appeared between doctors and insurance laymen, through an inability or unwillingness to recognize that a real solution can be attained only by the most adequate co-operation. It thus seems that the important question is not whether benefits should be in cash, or in kind; the vital problem concerns much more the extent to which control—essential to the success of any plan—shall be exercised by medical or non-medical administrators. In the examination of that problem the medical profession need have no hesitation in standing on the

ethical foundations of its practices—for, properly observed, they would eliminate many of the competitive and acquisitive temptations which in these days render "business" so difficult an occupation.

This view that the major problem is not really that of cash benefits *versus* benefits in kind appears to be at variance with some of the opinions expressed by the American Medical Association. In its booklet on "Organized Payments for Medical Services" (Bureau of Medical Economics, American Medical Association, 1939), that Association reaches the conclusion that "the insurance principle can best be applied if restricted solely to the *payment* of medical bills by returning to the insured a specified cash benefit for the services covered in the insurance", largely on the grounds that some unfortunate experiences had occurred in the early history of plans giving benefits in kind, and that such plans deal with partially unmeasurable benefits which change with the advancements of medical science. These objections, however, can be overcome by the adoption of sound insurance practices. This series of articles will therefore proceed on the conclusion that insurance schemes which grant benefits in kind are neither undesirable nor necessarily inferior to schemes giving only benefits in cash, and that a much more important question is the extent to which any health insurance plan secures the true co-operation of its three main groups — its insured members, its certifying doctors and others who provide the services, and its financial overseers. Not in any type of plan is it possible to remove from the insured the obligation to be honest, or from the doctors the duty of certifying claims, or from the administrators the responsibility of supervision. It is to be regretted that so many acceptable procedures have been attacked as a result of the erroneous assumption that one or more of these essential requirements can be eliminated.

THE REGULARIZATION OF PAYMENTS FOR HEALTH SERVICES BY METHODS OTHER THAN INSURANCE OR STATE MEDICINE

These misunderstandings and dissatisfactions with some types of health insurance have led to other methods of regularizing payments for health services which do not fall within the descriptions of "insurance" or "state medicine" previously given. While it is not always possible to place all these experiments in a sharply defined classification it may be said that, in general, they possess certain characteristic features which permit them to be identified as (1) "Post-payment" plans; (2) "Unit Service" or "Pro-rating" plans; (3) "Lodge Practice"; and (4) "Contract Practice".

(1) "POST-PAYMENT" PLANS

One of the essential features of "insurance" is that contributions are paid, in advance, by the members who may receive the benefits. But

where such pre-payment is difficult, it has been suggested recently that post-payment for services rendered may be effected on an instalment basis, particularly for the lowest income groups, through a "Medical Service Bureau".

The first such "post-payment" plan was established in 1934 by the Medical Service Bureau of the Wayne County Medical Society, Detroit. The medical, dental, nursing, hospital, and druggists' associations co-operate with the bureau. A patient applying to the bureau is referred to his chosen doctor, or in some plans the doctor makes the decision whether the patient shall be entitled to the bureau's services. The doctor diagnoses the illness and secures any nursing, hospital, etc., services through the bureau; all accounts are rendered to the bureau and charged against the patient; and the patient pays to the bureau, for not over one year, a weekly or monthly sum without interest—such sum having been agreed upon when he applied for service as being within his ability to pay, and not necessarily bearing any relation to the total of his account. By interchange of information the physician's and other charges are set, in effect, with the assistance of the bureau on the basis of the patient's known economic status, and all collections are distributed proportionately (or in other agreed manner) to those who have rendered services (subject usually to a 10% service charge, although some hospitals have held that figure to be too high). The patient is thus assured that he will not have financial demands made upon him which he cannot meet; he knows that at the end of one year the whole transaction will have run its course; he pays reduced fees and obtains credit, without accepting charity. The professional groups receive as much as they can reasonably expect. In some cases the plan has been accompanied by a "Central Admitting Bureau", for the purpose of investigating applicants for medical and other services, and assisting them to secure the necessary attention without abusing free medical facilities.

(2) "UNIT SERVICE" OR "PRO-RATING" PLANS

It may be recalled that under the French state health insurance system the reimbursement to the insured member is a variable percentage of agreed rates for various types of service (see article No. V). Following a similar principle, the "unit service" plan has been developed in the United States for indigent and low-income rural families, and for other groups as well. One of the most prominent has been that of the King County Medical Service Bureau, Seattle, which has been established by the medical society for employees earning up to \$1,800 per annum; others have been set up in Cincinnati, Fulton County, Ga., Michigan, and elsewhere. The method is to assign a number of "units" (not dollars) to each separate service as an indication of their relative values; when services are performed, the physician (for example) is credited

with the appropriate number of units; at the end of stated intervals (such as one month) the total units of service thus supplied are ascertained; the total funds available for distribution are then divided by this total number of units, so that the money value of the unit emerges for the period; and the physician is then paid for his own units according to this value. The result is that the physicians and others receive only their pro-rata shares of varying funds, which depend on the patients' abilities to pay, and on the efficiency of the bureau. This principle of computing payment is used also in the Medical Relief scheme operated by the Ontario Division of the Canadian Medical Association.

(3) "LODGE PRACTICE"

Prior to the 1911 health insurance legislation in Great Britain, various methods had been developed which attempted to provide medical care for small fees to those who could not afford to pay for anything beyond the very simplest services. Private medical "clubs" were formed, with agents, remunerated by commissions, who canvassed the working classes and collected small weekly sums from the members they secured. Many kinds of "medical aid societies" also appeared. The most important, however, were the "friendly societies", again of several different types—the large affiliated societies, with their local self-governing "courts" or "lodges", being particularly prominent. In order to provide medical care for their members, and often for their dependents too, the lodge would secure the services of a physician, who was paid a stated sum per annum for each person for whom he undertook to provide medical care. Because these lodge practices dealt largely with the poorer sections of the industrial population, there was naturally constant pressure to reduce the costs, so that the conditions of service often became unsatisfactory, and methods were introduced which contravened the ethics of the profession. In 1905 enquiries were instituted by the British Medical Association, which were assembled in a valuable report entitled "An Investigation into the Economic Conditions of Contract Medical Practice in the United Kingdom". The conclusion was reached that some form of such practice was essential under the conditions then prevailing amongst certain classes of the population, and recommendations were made with the object of securing better control by the medical profession, and recognition of its ethics. Lodge practice under the "fraternal societies" in North America has encountered similar problems, and generally offers, for about \$2.00 to \$2.50 per member per annum, only a minimum service (excluding major operations, obstetrics, venereal diseases, and x-rays). Objections urged against this form of practice are that the physician often accepts a lodge appointment, at a remuneration which is known to be inadequate, in order to secure the opportunity of providing additional

services on the basis of private fees, and that difficulties consequently arise when the members and their families find that the lodge arrangements do not entitle them to many of the important services required. The physician, furthermore, ultimately secures only insufficient payment for extended services. These features of lodge practice obviously cannot possibly encourage the best types of medical procedure.

(4) "CONTRACT PRACTICE"

Many of the preceding plans involve, either directly or by implication, an arrangement which, in effect, permits only one contracting physician, or a number of physicians, to render medical services to a particular group. They are often based, moreover, on some mode of payment which aims to fix the costs by abandoning the fee-for-service basis. The American Medical Association has accordingly defined "contract practice" in the following terms: "... the carrying out of an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization, political subdivision or individual, to furnish partial or full medical services to a group or class of individuals on the basis of a fee schedule, or for a salary or a fixed rate per capita". It has added, in its "Principles of Medical Ethics", that "contract practice *per se* is not unethical".

With such a definition it will be clear that a very wide variety of arrangements may be invented, and that in many of the medical service plans of industrial groups, universities, lodges, associations, and so forth, the services and remuneration of the doctor are secured by some kind of "contract practice". The question as to whether any such plan is desirable is largely a matter of the extent to which it satisfies the ethical requirements. It is not surprising, therefore, that contract practice has been the subject of much controversy, and particularly of misunderstanding by the public. The phraseology of the American Medical Association may accordingly be given here as a condensed and careful summary which should make it possible to determine the admissibility of any contract scheme: "Certain features or conditions if present make a contract unethical, among which are: (1) When there is solicitation of patients, directly or indirectly. (2) When there is underbidding to secure the contract. (3) When the compensation is inadequate to assure good medical service. (4) When there is interference with reasonable competition in a community. (5) When free

choice of a physician is prevented. (6) When the conditions of employment make it impossible to render adequate service to the patients. (7) When the contract because of any of its provisions or practical results is contrary to sound public policy." The Association's interpretation of these conditions embodies a similarly convincing statement of the spirit in which these contracts should be examined: "Each contract should be considered on its own merits and in the light of surrounding conditions. Judgment should not be obscured by immediate, temporary, or local results. The decision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole." The Canadian Medical Association, in its study of medical economics, is planning to investigate the conditions of contract practice throughout Canada.

THE PATIENT'S MINIMUM OBLIGATION, AND THE TAXATION OF ACCOUNTS

All of these different methods of attempting to provide adequate medical care for persons who, in many cases, simply cannot face the bills which would result from the use of all the best modern types of diagnosis and treatment have two primary objectives—the curbing of unreasonable demands upon the doctor, and the imposition of some restraint upon excessive costs. Shorn of complex regulations, so that these two problems may be faced directly, it has been suggested that in any plan, of whatever type, the patient should always be required to pay a stated minimum amount himself as his own personal contribution towards his obligations, and that the accounts which he has incurred should be identified by number only (not by name) and scrutinized by a "taxing committee" of the medical profession when such inspection appears to be desirable. The payment in every instance by the patient of a minimum amount follows the well-established insurance practice of requiring a "deductible amount" to be assumed by the individual who is insured. It imposes on the claimant, undoubtedly, a most desirable restraining influence, and is likely, without bringing resentments in its wake, to relieve any organized plan of a large proportion of trivial and unjustifiable demands. The activities of a taxing committee, however, would be more difficult, and easily might lead to a regimentation of the doctors' practices which would impair the physician's freedom of judgment with little ultimate advantage.

Cosmetics should not contain potent ingredients having constitutional effects. There is a potential danger to normal persons using cosmetics containing active treatment substances which, in the practice of medicine, are used to produce systemic changes. The topical application of vitamins on the skin for the treatment of vitamin deficiency is impractical and uneconomical. In certain cases in which absorption by ingestion is ineffective and injection is inadequate, the

percutaneous (through the skin) method may be tried. The use of vitamins in creams, lotions and soaps has not been proved to have cosmetic value.—J. J. Eller and S. Walff, *J. Am. M. Ass.*, 1940, 114: May 18th.

We should take counsel of reason upon that which befalls us and correct by our prudent conduct the injustice of Fortune, as a gamester repairs a stroke of ill luck by his skill.—Plato.

Retrospect

A REVIEW OF RECENT ADVANCES IN HORMONE AND VITAMIN THERAPY

By W. N. KEMP

Montreal

It would seem appropriate before entering the discussion of this subject to first call attention to some of the newer views regarding the clinical application of biological principles.

The first of these is the *principle of the potentiation of dosage division*. This principle is widely utilized by commercial houses in the biological standardization of gonadotrophic hormones. A rat, or a mouse, or a rabbit is given twice or thrice daily injections of the gonadotrope under assay for three days, and a certain standard effect upon the gonads or the vagina is noted by means of which the unitage of the product in question is computed. Then, with a degree of indifference to the marked disparity between biological effects in animals and therapeutic attempts in human beings which is truly remarkable, the product is passed on to the physician with the usual recommendation that it be injected into the patient *twice or thrice weekly!* This utterly unscientific recommendation is apparently based on the supposed resistance of patients to receiving treatment oftener than three times weekly! Probably there is something to be said for this supposed resistance to frequent injections, but it seems only reasonable to point out to physicians, and through them to patients, that the more frequent the injections, the more efficacious is the treatment and the shorter is its duration where a definite growth stimulating effect is the therapeutic objective, as in the treatment of uterine hypoplasia, etc. Unfortunately, like many another medical habit the Monday, Wednesday and Friday concept of gonadotrope administration has become firmly fixed in the minds of commercial houses and medical practitioners as well.

Probably of equal or even greater importance to the above principle of dosage division in therapeutic significance is the knowledge of which hormone should be used for each desired specific gonadotrophic, oestrogenic or progestational effect. For example, chorionic gonadotrophin should seldom, if ever, be used in the first half of the menstrual cycle to produce a gonadal effect; on the other hand, pituitary or equine gonadotrophin, when indicated, should almost always be used in the first phase of the menstrual cycle. The two latter gonadotropes, being preponderantly follicle-stimulating in their action, should be administered before the time of ovulation, while chorionic gonadotrophin, being preponderantly follicle-stimulating in their should be used in the second half of the cycle

for the purpose of stimulating the development and continuity of the corpus luteum after ovulation has already occurred. Of course, this therapeutic limitation for chorionic gonadotrophin does not apply to the treatment of metrorrhagia; here the immediate control of uterine hæmorrhage, a specific and empirical function of chorionic gonadotrophin, is the main desideratum of treatment.

Thirdly, comes the question of the proper timing of the administration of the gonadotrope or oestrogen or other hormone, particularly in relation to the events of the menstrual cycle, or, in a broader sense, to events of the whole female reproductive period. For example, in treating a patient for deficiency of the luteal phase, as for the purpose of stimulating corpus luteum function in a woman being treated for functional sterility, it is important not only to use chorionic gonadotrophin, but to defer its administration until the 18th day of the cycle in order to obviate any possibility of producing atretic follicles in the ovary and thus nullifying the other preceding and essential function of the ovary—the maturation and extrusion of a ripened ovum.

The last but by no means the least important principle to which attention is directed is the question of the use of none other than properly standardized hormones marketed by reputable firms. In this regard it is interesting to note that Hawkinson¹ has recently reported that out of a total of 27 so-called oestrogenic hormones on the American market examined by him only 6 were standardized and only 6 were of appreciable oestrogenic potency.

THE ANTERIOR PITUITARY GLAND

The growth-promoting "complex" of the anterior lobe of the hypophysis ("complex" because it probably consists of several hormonal elements or factors), first reported by Evans and recently improved by Collip, has been shown to be of great practical value in the treatment of patients showing skeletal growth retardation. Not only are frank "pituitary dwarfs" benefited by the administration of this hormone but many undersized children can be advantageously raised to a normal growth level by the judicious use of Collip's growth "complex".

The only other anterior pituitary hormone to which any practical value can be attached at the present time is "anterior pituitary gonadotrophin", or, as Collip has called it, "gonadotrophic factor". Parenthetically, it might be said that the three principal gonad-stimulating hormones (gonadotropes or gonadotrophins) have been respectively termed: "anterior pituitary gonadotrophin" (produced from the anterior lobes of cattle); "chorionic gonadotrophin" (produced from pregnancy urine), and

"equine or pregnant mares' gonadotrophin" (produced from the serum of pregnant mares).

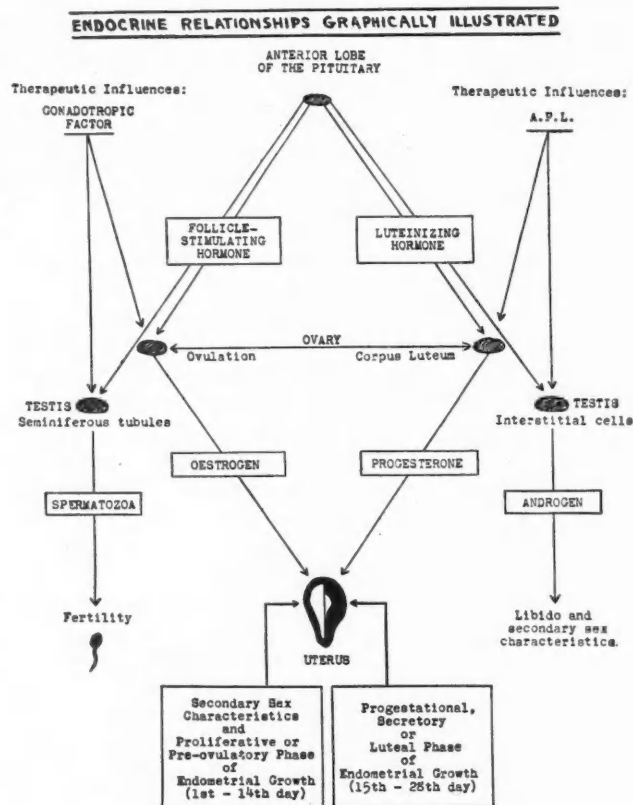
Chorionic gonadotrophin or A.P.L.—Chorionic gonadotrophin or, as Collip originally named it, A.P.L. (anterior pituitary-like hormone), is definitely of clinical value, the report of the Council of the American Medical Association to the contrary notwithstanding, for the treatment of meno-metrorrhagia, hypogenitalism, or Fröhlich's syndrome, deficiency of corpus luteum activity, and for the treatment of cryptorchidism, impotence or hypogonadism in males.

OTHER ENDOCRINE PRODUCTS

The use of endocrine products is pre-eminent for the control of functional uterine hæmorrhage, chorionic gonadotrophin, progesterone, and thyroid extract being particularly prominent in this field. Although the exact rationale of action of chorionic gonadotrophin has not yet been forthcoming that defect in no way detracts from its great clinical value in the treatment of functional uterine hæmorrhage. Lissner has for years emphasized the importance of thyroid extract in the treatment of menorrhagia, calling attention to the fact that irregular uterine hæmorrhage may itself be the presenting symptom of hypothyroidism, particularly in adolescents. Recently Shute, Mason and others have re-emphasized this correlation between thyroid hypofunction and irregular functional uterine hæmorrhage.

Metropathia hæmorrhagica.—This condition, known also as endometrial hyperplasia or cystic hyperplasia of the endometrium, is caused by a too prolonged oestrogenic action without the natural interruption and endometrial débridement which accompanies normal corpus luteum function through the ordinary mechanism of menstruation. These patients almost invariably have follicular cysts of the ovary, or ovaries, and invariably are "without benefit" of corpus luteum function. While, in many instances, these patients can be symptomatically controlled by the judicious use of chorionic gonadotrophin, the most effective treatment yet to be devised for the systematic control of this condition is the so-called "medical curettage"* of J. S. L. Browne,² of Montreal. He has suggested, following a preliminary surgical curettage of the uterus, that endometrial denudation be regularly induced by the periodic administration of progesterone, 5 mg. on alternate days for 4 injections. By this means a "medical curettage" can be induced at 4, 5, or 6 week intervals according to the judgment of the physician. In this manner regular periods of uterine bleeding are periodically induced which cannot, for all practical purposes, be distinguished from natural menstruation. Thus the "irregularly irregular" hæmorrhage of the metropathia patient is systematically brought under control.

* So named by Fuller Albright.



Pregnandiol.—Sodium pregnandiol glucuronide or "pregnandiol", as has been shown by Browne and Venning,³ is the excretion product of progestin or progesterone. These workers have formulated a valuable practical method of isolating and measuring this substance in the urine and, together with Henry,⁴ have shown the practical value of this test in evaluating (1) the occurrence of ovulation; (2) the adequacy or otherwise of the luteal phase of corpus luteum function, and (3) the imminence or otherwise of abortion.

Progesterone.—Progesterone is the crystalline synthetic form of progestin (corpus luteum hormone), and is available commercially for clinical use. The most important therapeutic applications of progesterone involve (1) the induction of "medical curettages" after the manner of Browne (described above); (2) the emergency control of uterine hæmorrhage; (3) the prophylactic treatment of habitual abortion and the actual treatment of threatened abortion, and (4) the control of after-pains. It is to be noted also that Browne's technique can be used to advantage in regularizing the irregular menstrual cycles commonly seen in adolescence, possibly using doses of progesterone considerably less than those required in the treatment of adults for metropathia hæmorrhagica.

Oestrogens.—Oestrogen is a general term given to substances exerting oestrogenic properties, viz., having the ability to produce œstrus in immature or gonadectomized animals. There are three natural oestrogens, (1) œstriol (œmenin, theelol, tri-hydroxyœstrin); (2) œstrone

(œstrin, theelin, keto-hydroxyœstrin), and (3) *œstradiol* (dihydroxyœstrin, di-folliculin, etc.). Only the first of these, œstriol, is sufficiently active *per os* for practical use. The most powerful œstrogen yet to be produced synthetically is Dodd and Robertson's well known "diethylstilbœstrol". This substance is about three times as active œstrogenically as œstrone, and, in addition, has the great practical virtue of being for all practical purposes as active following oral administration as after parenteral injection. Indeed, so powerful is this synthetic œstrogen that the incidence of nausea and other untoward symptoms which have commonly followed its use has been probably incorrectly ascribed to toxic influences. In my experience diethylstilbœstrol produces toxic manifestations only when it is administered in "single overdosage", *i.e.*, in too large single doses, such as 1 or 2 mg. If the total daily dose is divided into several 0.25 mg. doses, and particularly if each tablet or capsule is coated so that it will only slowly disintegrate in the intestine itself, little or no nausea or other untoward symptoms follows its administration. I hasten to add, however, that this statement is not to be interpreted as expressing the view that continued ingestion of a potent œstrogen such as diethylstilbœstrol is in the ultimate best interests of the patient.

The principal indications for the administration of œstrogens are, as one would expect, conditions of œstrogenic deficiency. Of these the commonest is the climacteric which results from abrupt and almost total ovarian insufficiency, whether natural or artificially induced. At this physiological epoch where hot flushes are the *bête noire* of treatment, diethylstilbœstrol is the most effective agent for the immediate control of symptoms. For this purpose, *i.e.*, the control of the hot flushes, very few patients require more than 2 mg. of diethylstilbœstrol a day, and many obtain comfort on a daily dosage of 1 mg. or less, provided only that the daily dose is divided into several doses distributed over the whole 24 hours.

If, as occasionally happens, a patient presents herself before the symptoms of the climacteric have become severe and while she is still menstruating, undoubtedly Collip's emmenin is the œstrogen of choice. In patients who are seen early and who are adequately treated with divided doses of emmenin, the severe symptoms of the climacteric can be prevented and they can gradually and without untoward symptoms be let down to the lower œstrogenic level upon which it is their future lot to live.

Another form of treatment for the menopausal syndrome which shows considerable promise is the subcutaneous implantation of pellets of an œstrogen such as œstrone. This therapeutic principle which was first described by Parkes and Deansley⁵ has been recently revived in a very practical form by Jacoby and Der Brucke.⁶ By their technique pellets of œstrone can easily

be implanted in the subcutaneous tissues where they will give a continuous œstrogenic effect and relieve the untoward symptoms of the climacteric for periods ranging from 2 to 16 weeks.

Schneider, Hawkinson, and others have called attention to a type of female patient undoubtedly suffering from partial ovarian deficiency many years before the menopause. These women are reported to be greatly benefited by the frequent daily administration of a standardized and orally active œstrogen such as emmenin.

Uterine and genital hypoplasia can now be adequately treated at a not-too-great cost to the patient by utilizing the new synthetic œstrogen, diethylstilbœstrol. By the judicious and well planned use of this substance, amenorrhœa, whether primary or secondary, can be successfully and inexpensively treated. In patients in whom the amenorrhœa is primary, or where it is associated with genital hypoplasia, it is usually advisable to follow the "substitutional therapy" of diethylstilbœstrol with "functional therapy" involving the use of pituitary or equine gonadotrophin in courses for two weeks, followed by injections of chorionic gonadotrophin to stimulate the corpus luteum to produce the second or luteal phase of the cycle.

Androgens.—Androgen is a generic term applied generally to what used to be termed "male-sex hormones". Androsterone, one of the early male sex hormones, has been succeeded by the more potent testosterone, the brain child of Ruzsika. Undoubtedly the synthesis of testosterone marks a notable achievement in biological chemistry. The propionate of testosterone is now commercially available, and is quite capable of developing male secondary sex characteristics and libido and potentia in eunuchs, provided only large and long-continued dosage regimens are followed. McCullagh⁷ has reported one such eunuchoid adolescent who after approximately 3,200 mg. of testosterone bloomed into real virile manhood. Unfortunately, like other forms of purely substitutional therapy, testosterone administration must be continued indefinitely in these cases to prevent relapse to the eunuchoid condition.

Testosterone propionate has been recommended, and indeed has been used, for many other and varied conditions in both males and even in females. Here the point of wonder is not that it will produce the "pituitary inhibition" etc. which is claimed for it but that it is used for this purpose when other more suitable and less hazardous forms of endocrine treatment are available.

THE ADRENAL GLAND

The pharmacodynamic action of epinephrine, the active secretion of the chromaffin cells of the adrenal medulla, is too well known to require consideration here. Rather would it seem more apropos briefly to discuss the therapeutic possibilities of the adrenal cortex and its secretion or

secretions, it being supposed that there are others in addition to cortin.

Addison's disease.—As was expected, cortin and its more recent synthetic counterparts, desoxycorticosterone and the other adrenal steroids, are of distinct value in the treatment of this well known but comparatively rare disease. Thorn has recently shown that the subcutaneous implantation of pellets of desoxycorticosterone acetate are of great value in the treatment of this disease. However, it is interesting to note that, judging from recent reports presented at the Twelfth Annual Meeting of the Central Society for Clinical Research,⁸ desoxycorticosterone lacks something which the natural adrenal secretion, cortin, contains. In the opinion of the writer this missing something is most probably ascorbic acid or vitamin C, a substance which was first found in the adrenal cortex by Szent-Györgyi. In addition to substitutional treatment with natural cortin or synthetic adrenal steroids large quantities of sodium chloride are, of course, required by Addisonian patients to compensate for the great loss of chlorides which is so characteristic of clinical and experimental cortico-adrenal insufficiency.

The vomiting of pregnancy.—In 1931 I ventured to make a number of "educated guesses"; among others that the vomiting of pregnancy as well as the syndrome occurring in infancy known as status lymphaticus (the so-called "thymus syndrome") were both clinical manifestations of temporary cortico-adrenal deficiency. The writer's own work,⁹ which was confirmed by Freeman and Melick¹⁰ in 1936, and recently by Kotz and Kaufman¹¹ would seem to prove the almost specific action of adrenal cortical hormone (or hormones) for the prevention and treatment of the common syndrome of nausea and vomiting so often associated with the first trimester of pregnancy. It would appear that "cures" for the vomiting of pregnancy have for so many years been the "Wolf! Wolf!" of practical medical practice that it takes a long time for a really effective form of therapy to receive general trial! Nor is this to be wondered at.

Status lymphaticus, or the "thymic syndrome", continues to account for many sudden deaths in infants particularly in the Pacific north-west. In the interim the writer's early hypothesis has not been confirmed or denied, save only by Kinsman¹² who reported marked improvement in 8 children suffering from the so-called "breath-holding" spells which are generally regarded in Vancouver, B.C., as a sub-clinical form of status lymphaticus, or, as some would term it, the "thymic syndrome". After treatment with desiccated adrenal cortex by mouth the patients reported by Kinsman, previously ineffectively treated by irradiation of the thymus area, were rendered symptom-free.

In addition to the two clinical syndromes above mentioned the writer¹³ has also ventured

to suggest that the administration of adrenal cortical secretion or glandular substance is indicated in the treatment of severe burns, acute toxæmias, and cyclic vomiting. Evidence is gradually accumulating which suggests that several of these hypothetical arrows have not been so wide of the mark and perhaps deserve further clinical study. Of one thing, I am convinced, and that is that the adrenal cortical hormone (or hormones) or its allied synthetic steroids requires the co-administration of ascorbic acid in order to obtain its full beneficial effect in prophylaxis or treatment.

RECENTLY DISCOVERED VITAMINS AND NEW USES OF OLDER VITAMINS

Vitamin K.—Of the life-saving value of this fat-soluble vitamin in patients with biliary obstruction or biliary fistula there can no longer be any doubt. Vitamin K is now known to be the essential link which is missing in these and other cases of the so-called hæmorrhagic diathesis of biliary obstruction, the lack of which causes prothrombin deficiency of the plasma and increased prothrombin clotting time and hæmorrhage. In addition to the comparatively uncommon instances of prothrombin deficiency mentioned above, vitamin K has been proved of value in the hæmorrhagic tendency associated with chronic intestinal diseases such as amœbiasis and chronic ulcerative colitis. Probably the greatest field for the use of this vitamin however, is in the prevention and treatment of the hæmorrhagic disease of the newborn. This is virgin experimental territory which is being rapidly explored by several groups of investigators in different clinics here and in Europe.

Vitamin P.—Szent-Györgyi, who first discovered vitamin C (ascorbic acid or hexuronic acid) in the adrenal cortex, and his associates^{14, 15} have described what appears to be a new vitamin, the "permeabilitat vitamin" or vitamin P. This latter appears to be a mixture of two flavones, hesperidin and eriodictyol glucoside. Györgyi and his associates and others who have confirmed their original findings believe that this vitamin (also called "citrin") is related to capillary resistance. The discoverers¹⁵ state: "The active substance was found in the end in a fraction consisting of practically pure flavon or flavonol glycoside. Forty mg. of this fraction given intravenously daily to a man regularly restored in a fortnight the normal capillary resistance. Spontaneous bleeding ceased, the capillary walls lost their fragility towards pressure differences, and no more plasma protein left the vascular system on increased venous pressure . . . We propose to give the name vitamin P to the substance responsible for the action on vascular permeability". Latze¹⁶ has confirmed this experimental work.

While some clinical investigators deny the capillary resistance effect of vitamin P in human beings, others, notably Scarborough and

Stewart,¹⁷ have concluded that the oral administration of this new vitamin does reduce the number of ecchymoses in patients in general vitamin deficiency. They reported this favourable action on capillary resistance not only in vitamin deficient patients in whom petechial hæmorrhages were induced by ordinary application of pressure but also in patients exhibiting spontaneous hæmorrhages after heavy doses of arsenic or bismuth (*i.e.*, examples of the "hæmorrhagic capillary toxicosis" of Frank). They further stated that this beneficial action upon the capillaries apparently exerted by vitamin P was independent of the presence of ascorbic acid or vitamin C in the diet. Lajos¹⁸ has reported that vitamin P exerts a favourable effect on capillary resistance, causing decreased capillary permeability in patients suffering from vascular purpura and in instances of the hæmorrhagic nephritides. Raunert¹⁹ claims that vitamin P, orally or intravenously administered, is useful in controlling bleeding in a variety of urological conditions such as the hæmaturia of nephritis and the general hæmorrhagic oozing sometimes noted following prostatic resection and lithotripsy. In all of his cases vitamin C was found to be valueless. He used 50 mg. of vitamin P intravenously, or 100 mg. by mouth, in treatment.

Jersild²⁰ has reported an interesting case of Schönlein-Henoch's purpura of eight years' duration which was successfully treated with vitamin P. In this case the painful swelling of the joints, the nausea, the ecchymoses, etc. all disappeared following daily intravenous injections of 50 mg. of vitamin P. As a result of these and other carefully controlled findings in this case Jersild concluded that all of the characteristic symptoms and signs of Schönlein-Henoch's purpura may be explained on the basis of deficiency of vitamin P.

Vitamin B₁.—In addition to its use for the alleviation of symptoms of subclinical beriberi (*i.e.*, anorexia, constipation, peripheral neuritis, etc.) vitamin B₁ (thiamin) has a specific analgesic effect in several conditions associated with severe pain, of which the lightning pain of intractable cases of tabes dorsalis is an example.

Nicotinic acid.—This important member of the great "B complex" family of vitamins is now established as a specific for the treatment of pellagra. In addition to this corrective use of nicotinic acid (or its amide) in the treatment of frank and subclassical pellagra, Graham²¹ has shown that it is almost specific for the prevention and treatment of radiation sickness. Further, it has been reported to be of value in the prevention of the untoward symptoms of sulphonamide therapy.

Vitamin B complex.—Recent clinical studies of Kristensen and Vendel, of Copenhagen, and others indicate that the vitamin B complex is

an important factor in the successful treatment of certain chronic skin conditions, notably eczema.

Vitamin E.—Einarson and Ringsted²² have suggested from their experimental studies that the muscular dystrophies and amyotrophic lateral sclerosis in human beings may be related to vitamin E deficiency. Bicknell,²³ following up the animal experiments of Einarson and Ringsted by a small series of clinical therapeutic trials, is of the opinion that, "The results of giving vitamin E for muscular dystrophy and amyotrophic lateral sclerosis support the contention that these are deficiency diseases and curable".

It would appear that much progress has been made in translating the findings of the biologist and the biochemist and the endocrine-minded experimental physiologist into terms of practical therapy for the human patient. Much remains to be done, but one cannot review the work of the past decade without being impressed with the progress that practical endocrinology has made. Our knowledge of vitamin deficiency diseases has made great progress also. Within the last two years such important vitamins as vitamin K, nicotinic acid, vitamin B₆, or adermin, and vitamin P have been added to the list of known and important vitamins. Of almost equal importance, however, is the fact that many new and valued pharmacodynamic uses are being evolved for the already impressively long list of proved vitamins, many of which are now obtainable in crystalline form.

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"OSLER AT OLD BLOCKLEY"

A Painting by Dean Cornwell, N.A.

THE most recent in the series of paintings "Pioneers of North American Medicine", "Osler at Old Blockley", depicts Sir William Osler surrounded by a group of interns at the bedside of a patient in the hospital ward, at Philadelphia's old Blockley Hospital during the period 1884-1889. It was in this institution that he continued the reforms in the teaching of Medicine instituted at McGill University.

In the background is the old autopsy building, where some of Sir William's most important research and teaching was done. This building has recently been restored through a grant from John Wyeth & Brother and will be dedicated June 8th, 1940. This will be the first Osler Memorial in the United States.

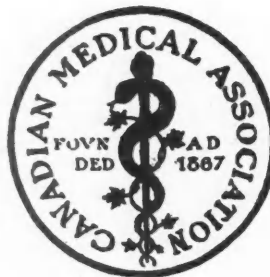
Before beginning the actual painting, Mr. Cornwell consulted, among others, Dr. William Francis, nephew of Osler, now curator of the Osler Memorial Library at McGill. Months were spent by the artist in historical research to assure the authenticity of all details.

The artist said recently, "I have attempted to recreate a scene typical of one of Osler's greatest contributions, namely, bringing the students to the bedside of the patient for clinical study".

The Canadian premier showing of "Osler at Old Blockley" will be held during the Canadian Medical Association Meeting at the Royal York Hotel, Toronto, under the sponsorship of John Wyeth & Brother.



"OSLER AT OLD BLOCKLEY"
By Dean Cornwell, N.A.



THE 71st ANNUAL MEETING OF THE
Canadian Medical Association

In Conjunction with the 60th Annual Meeting of the
ONTARIO DIVISION OF THE ASSOCIATION

TORONTO, JUNE 17, 18, 19, 20, 21, 1940

Convention Headquarters, Royal York Hotel

The Canadian Medical Association

President, F. S. PATCH, Montreal;

President-elect, DUNCAN A. GRAHAM, Toronto;

General Secretary, T. C. ROUTLEY, Toronto.

The Ontario Division

President, W. A. JONES, Ottawa;

President-elect, A. B. WHYTOCK, Niagara Falls;

Secretary, A. D. KELLY, Toronto.

THE CONVENTION

Plans have been completed for what promises to be an outstanding convention. An excellent scientific program has been arranged covering almost every field of medical interest. The Round-Table Conferences in the various medical fields and the Instructional Courses, which proved so popular last year, are being held again immediately preceding the morning sectional meetings. Another innovation will be the Round-Table Discussion on Goitre at the Friday luncheon. A special feature this year will be the Medical Economics Dinner arranged for the Thursday night. The highlight of the convention will be the ceremonious annual general meeting on the Wednesday evening followed by the President's Reception and the Dance.

A delightful Ladies' Program has been arranged by Mrs. Duncan Graham and her committee. In addition to an excellent program of functions and with the thought of making the hospitality as personal as

possible, the Toronto ladies are planning that out-of-town wives will be guests at private dinners on Thursday evening, while their husbands are at the Medical Economics Dinner. A section has been reserved at the Toronto Promenade Symphony Concert at the University Stadium that evening for those desiring to hear this popular orchestra led by Mr. Reginald Stewart.

A large attendance is anticipated and advance registrations would support this expectation. With our country at war and with replies in hand from several thousands of our doctors indicating their willingness to serve their country, it is but to be anticipated that there will be a keen desire for the doctors to get together and talk things over.

A list of hotels and other data were published in the May *Journal*. Members are advised to make their reservations well in advance at the hotel of their choice.

COMMITTEES

Committee in Charge of Local Arrangements

Drs. Duncan A. Graham (*Chairman*), Harvey Agnew (*Secretary*), Harris McPhedran, D. E. Robertson, J. Lloyd Burns, William Magner, T. C. Routley, Arthur Kelly.

Program Committee

Drs. Duncan A. Graham (*Chairman*), T. C. Routley (*Secretary*), Alan Brown, H. K. Detweiler, H. A. Dixon, J. H. Elliott, A. A. Fletcher, Roscoe R. Graham, E. B. Hardy, Alex MacDonald, J. C. McClelland, G. E. Richards, W. A. Scott, H. J. Shields, D. E. S. Wishart, G. S. Young, Arthur Kelly.

Scientific Exhibits

Dr. Melville C. Watson (*Chairman*).

Commercial Exhibits

Dr. Henry C. Wales (*Chairman*).

Registration and Information

Dr. Gilbert Parker (*Chairman*).

Luncheons and Dinners

Dr. S. J. N. Magwood (*Chairman*).

Golf

Dr. W. C. Givens (*Chairman*).

Ceremonial Procedure

Dr. F. A. Logan (*Chairman*).

Transportation

Dr. R. H. Thomas (*Chairman*).

Signs and Badges

Dr. Wright Young (*Chairman*).

LADIES' COMMITTEES

Ladies' Executive Committee

Convener Mrs. Duncan Graham
Vice-Convener Mrs. D. E. Robertson
Honorary Secretary . Mrs. A. D. Kelly
Honorary Treasurer . Mrs. Harris McPhedran
Honorary Member . . Mrs. W. A. Jones
Members-at-Large . . Mrs. T. C. Routley
 Mrs. Geo. S. Young

Entertainment

Chairman Mrs. W. E. Gallie

Registration and Information

Mrs. Roscoe R. Graham Mrs. Harvey Agnew
 Mrs. Almon Fletcher

Reception

Mrs. F. N. G. Starr Mrs. Alexander Primrose

Entertainment

Mrs. W. E. Gallie Mrs. James C. McClelland
 Mrs. H. K. Detweiler

Dinners

Mrs. Charles H. Hair Mrs. E. W. Mitchell
 Mrs. William Magner

Luncheon

Mrs. D. King Smith

Promenade Concert

Mrs. Alexander E. MacDonald

Flowers

Mrs. Alan Brown Mrs. G. E. Richards

Transportation

Mrs. H. J. Shields Mrs. Robin Pearse

Publicity

Mrs. R. B. Kerr Mrs. Burns Plewes

CANADIAN FEDERATION OF MEDICAL WOMEN

The Canadian Federation of Medical Women will hold a luncheon in the Roof Garden of the Royal York Hotel, on Thursday, June 20th, at 12.15 o'clock.

A short business session will be held at the conclusion of the luncheon.

CANADIAN MEDICAL PROTECTIVE ASSOCIATION

The Canadian Medical Protective Association will hold its annual meeting immediately following the scientific program on the afternoon of Thursday, June 20th.

MOTION PICTURES

Motion pictures on various medical subjects will be shown at periods to be announced during the convention. Pictures to be shown must be approved by the Chairman of the appropriate section. Any member desiring to show a film should communicate with either the Chairman of the corresponding section or with the Secretarial Office.

TRANSPORTATION

Convention fares may be obtained on the Identification Certificate Plan.

From points in Eastern Canada, i.e., Fort William, Armstrong and East — Round-trip tickets, good going from June 12th to June 19th, inclusive, will be sold on presentation of Identification Certificates.

From points in Western Canada, round-trip tickets are good going on the following dates:

From British Columbia—June 9th to 17th, inclusive;

From Alberta—June 10th to 18th, inclusive;

From Saskatchewan, Manitoba and Ontario (west of Port Arthur and Armstrong—

June 11th to 19th, inclusive.

Return Limit—Thirty days in addition to date of sale. Passengers must reach original starting point not later than midnight of final return limit.

Fare Basis—Round-trip tickets to be sold at the rate of fare and one-third of current fares, plus 25 cents, upon presentation of Identification Certificates to ticket agents at time of purchase of tickets; going and returning via same route, or going via one authorized route and returning via any other authorized route.

When purchasing tickets inquire of your local agent *re* summer excursion rates. It is possible that there may be summer rates in effect which will be even more attractive than convention rates.

Identification Certificates may be obtained

from The General Secretary, 184 College Street, Toronto, Ontario.

REGISTRATION AND HOUSING

For information on Registration and Housing, see May issue of the *Journal* (page 486).

GOLF

St. Andrew's Golf Course has been selected for the Golf Tournament on Tuesday, June 18th. The Committee is very desirous to assist visiting doctors to make arrangements for this event. There are several courses at Toronto over which the Canadian open tournament has been played in recent years, and the Committee will endeavour to arrange games thereon for those sending in their names and handicaps. If any of those arriving early would like to have golfing privileges over the week end they should communicate with the Chairman of the Golf Committee, Dr. W. C. Givens.

It is suggested that the Canadian Medical Association Councillors could play Tuesday afternoon, and Counsellors of the Ontario Division in the morning.

GENERAL PROGRAM

(See also Ladies' Program)

All time stated in this program is Eastern Daylight Saving Time.

Friday and Saturday, June 14th and 15th Executive Committee Sessions

Monday, June 17th

- 9.00 a.m.—Registration
- 9.30 a.m.—Meeting of General Council.
- 1.00 p.m.—Luncheon.
- 2.00 p.m.—Meeting of General Council.
- 6.00 p.m.—Meeting of Nominating Committee.
- 7.00 p.m.—Medical Secretaries' Dinner and Conference.

Tuesday, June 18th

- 9.00 a.m.—Registration
- 9.30 a.m.—Meeting of General Council.
- All day—Golf Tournament.
- 2.00 p.m.—Meeting of Council, Ontario Division.
- 3.00 p.m.—Joint Relations Council on Medical Education, Hospitals and Licensure.
- 7.00 p.m.—Dinner to General Council and to Council of the Ontario Division.
Host: Toronto Academy of Medicine.

Wednesday, June 19th

- 8.30 a.m.—Registration.
- 9.00 a.m.—Round-Table Conferences.
- 10.00 a.m.—Board of Directors of the Ontario Division.
- 10.15 a.m.—General Session.

Wednesday, June 19th—Continued

- 12.30 p.m.—Luncheon.
- 2.00 p.m.—Sectional Meetings.
- 2.00 p.m.—Board of Directors of the Ontario Division.
- 4.30 p.m.—Reception by President-elect and Mrs. Graham, Hart House.
- 8.30 p.m.—Annual General Meeting.
- 10.00 p.m.—Reception and Dance.

Thursday, June 20th

- 8.30 a.m.—Registration.
- 9.00 a.m.—Round-Table Conferences.
- 10.15 a.m.—General Session.
- 12.30 p.m.—Luncheon.
- 2.15 p.m.—Sectional Meetings.
- 2.15 p.m.—Meeting of incoming C.M.A. Executive Committee.
- 4.30 p.m.—Annual Meeting, Canadian Medical Protective Association.
- 7.00 p.m.—Dinner, followed by
Medical Economics Evening.

Friday, June 21st

- 8.30 a.m.—Registration.
- 9.00 a.m.—Round-Table Conferences.
- 10.15 a.m.—General Session.
- 12.30 p.m.—Luncheon (Special Round-table Discussion on Goitre).
- 2.15 p.m.—Sectional Meetings.

LADIES' PROGRAM

Visiting Ladies are requested to register *immediately* upon arrival. They will be supplied with badges and will be given programs containing full information regarding social functions.

Monday, June 17th

- 4.00 p.m.—Tea at the Royal Ontario Museum, for the wives of members of the Canadian Medical Association General Council.
Hostess—Mrs. Alexander Primrose.

Tuesday, June 18th

- 1.00 p.m.—Lunch at the Toronto Golf Club, for the wives of members of the General Council.
Hostess—Mrs. Duncan Graham.
- 6.30 p.m.—Buffet Supper at the Academy of Medicine, 13 Queen's Park, for the wives of members of General Council and the wives of Counsellors of the Ontario Division.
Hostesses—Wives of members of the Academy of Medicine.

Wednesday, June 19th

- 4.30-6.00 p.m.—Reception at Hart House for members of the Association and their wives by the President-Elect of the Canadian Medical Association and Mrs. Duncan Graham.

SCIENTIFIC PROGRAM**GENERAL SESSIONS****Wednesday, June 19th**

- 10.15 a.m.—
Treatment of injuries and infections of the hand
—Dr. J. H. Couch, Toronto.
- The clinical significance of bronchial obstruction
—Dr. J. D. Adamson, Winnipeg.
- President's Valedictory Address**—Dr. Frank S. Patch, Montreal.
- The Blackader Lecture**—A decade of pædiatric progress—Dr. Alan Brown, Toronto.

Thursday, June 20th

- 10.15 a.m.—
Anorexia nervosa—Dr. Ray Farquharson, Toronto.
- Intestinal obstruction—Dr. Alan Curry, Halifax.
- The course and prognosis of otitis media under new and old methods of treatment—Dr. E. P. Fowler, Jr., New York.
- Shock: its recognition and treatment—Dr. J. C. Meakins, Montreal.

Wednesday, June 19th—Continued

- 8.30 p.m.—Ceremonial and Installation of President of the Canadian Medical Association at the Royal York Hotel.
- 10.00 p.m.—Association Reception and Dance.

Thursday, June 20th

- 1.00 p.m.—Lunch at the Toronto Hunt Club.
Tickets \$1.00.
Transportation will be arranged at Registration Desk, when registering.
- 6.30 p.m.—Dinner—The Ladies' Committee is arranging that all out-of-town wives will be guests at private dinners.
- 8.30 p.m.—The Toronto Promenade Symphony Concert, at the Varsity Arena. Those wishing to attend will proceed with their hostesses to the concert. Ladies will obtain tickets (50 cents) in advance at the Registration Desk.

Friday, June 21st

Friday will be reserved for private engagements. Members of the Committee will be at the Registration Desk until 1.00 p.m. to provide any information desired respecting shopping, sightseeing or week-end plans.

YOUNG PEOPLE'S PROGRAM

A young people's program will not be formally arranged this year. However, members and their wives are invited to bring their families with them to enjoy the many diversions in the Toronto area.

Friday, June 21st

- 10.15 a.m.—
Acute abdominal pain—Dr. Fulton Gillespie, Edmonton.
- The diagnosis and treatment of hyperthyroidism
—Dr. J. H. Means, Boston.
- Urticaria—Dr. J. Gardner Hopkins, New York.
- Subtotal gastrectomy for gastro-duodenal ulcer
—Dr. Gavin Miller, Montreal.

ROUND-TABLE CONFERENCES AND INSTRUCTIONAL COURSES

PLEASE NOTE: Attention is directed to the following Round-Table Conferences and Instructional Courses. These meetings will attempt to answer and briefly discuss problems that arise in the course of every day practice and it is hoped that as many as possible will come prepared to take part and to submit questions. It will greatly facilitate the management of each program if questions could be submitted well in advance. These may be mailed to the General Secretary of the Canadian Medical Association or may be sent directly to chairmen of the conferences.

Section of Dermatology

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

Mucous membrane Lesions.

Dr. E. J. Trow, Toronto (*Chairman*).**Section of Medicine**

WEDNESDAY, JUNE 19TH

9.00-10.00 a.m.—

Diabetic complications.

Dr. A. A. Fletcher, Toronto (*Chairman*);

Dr. Angus MacKay, Toronto;

Dr. Walter Campbell, Toronto.

THURSDAY, JUNE 20TH

9.00-10.00 a.m.—

What are the dangers in the use of sulfanilamide and allied drugs?

Dr. E. A. Broughton, Toronto (*Chairman*);

Dr. Hurst Brown, Toronto;

Dr. J. A. Dauphinee, Toronto.

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

What is hypertension?

Dr. John Oille, Toronto (*Chairman*);

Dr. John Hepburn, Toronto;

Dr. H. C. Cruikshank, Toronto.

Section of Obstetrics and Gynaecology

WEDNESDAY, JUNE 19TH

9.00-10.00 a.m.—

Labour delayed in the first stage.

Dr. R. W. Wesley, Toronto (*Chairman*).

THURSDAY, JUNE 20TH

9.00-10.00 a.m.—

The therapeutic use of endocrine preparations in gynaecology.

Dr. N. D. Frawley, Toronto (*Chairman*);

Dr. Nelson Henderson, Toronto;

Dr. Melville Watson, Toronto;

Dr. R. B. Meiklejohn, Toronto.

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

Repair of birth injuries.

Dr. W. G. Cosbie, Toronto (*Chairman*).**Section of Ophthalmology**

WEDNESDAY, JUNE 19TH

9.00 to 10.00 a.m.—

Modern presbyopic corrections.

Range;

Only before 47 with special reasons;

Use in convergence and esotropia;

Types for special near workers;

Dr. W. H. Lowry, Toronto (*Chairman*).

THURSDAY, JUNE 20TH

9.00 to 10.00 a.m.—

(Combined with Section of Otolaryngology)

Headache.

Dr. Angus Campbell, Toronto (*Chairman*);

Dr. A. L. Morgan, Toronto;

Dr. J. N. McKinley, Toronto.

FRIDAY, JUNE 21ST

9.00 to 10.00 a.m.—

Lesions of the macula (lantern slides).

Dr. C. E. Hill, Toronto (*Chairman*).**Section of Otolaryngology**

WEDNESDAY, JUNE 19TH

9.00-10.00 a.m.—

Instructional Courses

Diagnosis and present treatment of sinus disease—Dr. P. G. Goldsmith, Toronto.

Technique of mastoid surgery—Dr. J. A. Sullivan, Toronto.

Allergy in relation to the ear, nose and throat—Dr. A. T. Henderson, Montreal.

Conservative and radical treatment of chronic otorrhœa—Dr. J. T. Rogers, Montreal.

THURSDAY, JUNE 20TH

9.00-10.00 a.m.—

Round-table Conference(Combined with Section of Ophthalmology)
Headache.Dr. Angus Campbell, Toronto (*Chairman*);

Dr. A. L. Morgan, Toronto;

Dr. J. N. McKinley, Toronto.

Instructional Courses

Diagnosis and present treatment of sinus disease—Dr. P. G. Goldsmith, Toronto.

Allergy in relation to the ear, nose and throat—Dr. A. T. Henderson, Montreal.

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

Round-table Conference

Cough and hoarseness.

Dr. A. H. Veitch, Toronto (*Chairman*);

Dr. G. E. Hodge, Montreal;

Dr. S. L. Alexander, Toronto.

Instructional Courses

Technique of mastoid surgery—Dr. J. A. Sullivan, Toronto.

Conservative and radical treatment of chronic otorrhœa—Dr. J. T. Rogers, Montreal.

Section of Pædiatrics

WEDNESDAY, JUNE 19TH

9.00-10.00 a.m.—

Breast feeding and feeding in the newborn period.

Dr. C. E. Snelling, Toronto (*Chairman*);

Dr. G. P. Hamblin, Toronto;

Dr. Edward Harkins, Toronto.

THURSDAY, JUNE 20TH

9.00-10.00 a.m.—

Immunization in childhood.

Dr. Nelles Silverthorne, Toronto (*Chairman*);

Dr. Donald Fraser, Toronto;

Dr. Beverley Hannah, Toronto.

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

Common behaviour problems in childhood.

Dr. Wm. A. Hawke, Toronto (*Chairman*);

Dr. E. P. Lewis, Toronto;

Dr. J. D. Griffin, Toronto.

Section of Surgery

WEDNESDAY, JUNE 19TH

9.00-10.00 a.m.—

Empyæma.

Dr. R. M. Janes, Toronto (*Chairman*);

Dr. E. C. Janes, Hamilton;

Dr. A. J. Grace, London;

Dr. Hurst Brown, Toronto.

THURSDAY, JUNE 20TH

9.00-10.00 a.m.—

Hæmatemesis.

Dr. N. S. Shenstone, Toronto (*Chairman*);

Dr. P. H. T. Thorlakson, Winnipeg;

Dr. A. J. Maltby, Toronto;

Dr. Geo. E. Wilson, Toronto.

FRIDAY, JUNE 21ST

9.00-10.00 a.m.—

The management of fractures. Discussion to centre about—

(1) First aid treatment;

(2) Compound fractures;

(3) Skeletal traction and internal fixation.

Dr. R. I. Harris, Toronto (*Chairman*);

Dr. Fraser Gurd, Montreal;

Dr. John R. Naden, Vancouver;

Dr. George Armstrong, Ottawa;

Dr. W. A. Gardner, Winnipeg.

SECTIONAL MEETINGS

Section of Anæsthesia

Chairman, DR. H. J. SHIELDS
Secretary, DR. KENNETH M. HEARD

THURSDAY, JUNE 20TH

2.15 p.m.—

Clinical and experimental study of normal-propyl-ethyl ether—Dr. W. E. Brown and Professor G. H. W. Lucas, Toronto.

Anæsthesia in the patient with pulmonary tuberculosis—Dr. H. E. Pugsley, Gravenhurst.

Respiration during anæsthesia—Dr. Digby Leigh, Montreal.

Conditioned reflexes and anæsthesia—Dr. Simon Dworkin, Montreal.

Combined nupercain spinal and cyclopropane anæsthesia—Dr. Rice Meredith, Toronto.

FRIDAY, JUNE 21ST

2.15 p.m.—

Unusual reactions occurring during anæsthesia case reports (each speaker allowed seven minutes)—Drs. Ellen Blatchford, Toronto; Clayton G. Bryan, Toronto; John Chassels, Toronto; J. H. Burgess, Ottawa; D. C. Aikenhead, Winnipeg; Edmund Lunney, Saint John; Robert Ferguson, Montreal; Karl E. Hollis, Toronto; P. E. Allard, Quebec; W. M. Cody, Hamilton.

Section of Dermatology

Chairman, DR. H. A. DIXON
Secretary, DR. F. S. LAZENBY

THURSDAY, JUNE 20TH

2.15 p.m.—

Eczematous dermatitis of contact type—Dr. S. E. Grimes, Ottawa.

Lichen planus: Its relation to vitamin B deficiency—Dr. J. F. Burgess, Montreal.

Results of the artificial-fever treatment of neurosyphilis—Dr. Albéric Marin, Montreal.

Thursday, June 20th—Continued

Acneform eruptions—Dr. L. P. Ereaux, Montreal.

Dermatological neuroses—Dr. W. R. Jaffrey, Hamilton.

Fungus infections of the skin—Dr. W. G. Brock, Winnipeg.

FRIDAY, JUNE 21ST

2.15 p.m.—

Clinical demonstration of patients at Toronto General Hospital.

Section of Historical Medicine

Chairman, DR. JABEZ H. ELLIOTT
Secretary, DR. JOHN ROSS

WEDNESDAY, JUNE 19TH

(Osler Hall, Academy of Medicine, 13 Queen's Park, Toronto)

2.00 p.m.—

Postage stamps of medical and pædiatric interest—Dr. T. G. H. Drake, Toronto.

The Klotz library—Dr. W. L. Holman, Toronto. Bucke and Osler; a personality study—Dr. Geo. Stevenson, London.

Indian medicine in western Ontario (illustrated by medicine songs)—Dr. Edwin Seaborn, London.

Shakespeare's son-in-law, Dr. John Hall—Dr. E. P. Scarlett, Calgary.

Exhibits

(a) To illustrate papers read:

1. Postage stamps of medical and pædiatric interest.

2. The Klotz library.

(b) Academy exhibits of interest to visiting physicians:

1. The Osler collection of prints and engravings.

2. The Academy's Osleriana.

Wednesday, June 19th—Continued

3. The "Johnston Cabinets" with microscopes and slides used by Johnston, Bovell and Osler.
4. The collection of lecture cards, medals, diplomas, instruments, etc., of early Ontario doctors.
5. The collection of medical book plates.

THURSDAY, JUNE 20TH

2.15 p.m.—

- The iconography of Theodore Turquet de Mayerne—engravings and portraits (lantern slides)—Dr. Thomas Gibson, Kingston.
- Military medicine, long ago, yester-year and tomorrow—Dr. Léo Pariseau, Montreal.
- A doctor of phisick—Dr. Heber Jamieson, Edmonton.
- Natural philosophy in the reign of King Charles II—Dr. A. G. Nicholls, Montreal.
- The history of fractures in Canada (lantern slides)—Dr. J. H. Couch, Toronto.

Section of Medicine

Chairman, DR. H. K. DETWEILER
Secretary, DR. J. G. FALCONER

WEDNESDAY, JUNE 19TH

2.00 p.m.—

- Diabetes mellitus: problems of its control—Dr. Lillian Chase, Regina.
- People who are always complaining—Dr. A. H. Gordon, Montreal.
- The management of obesity—Dr. Lennox Bell, Winnipeg.
- Recognition and treatment of Addison's disease—Dr. R. A. Cleghorn, Toronto.
- Practical aspects of allergy—Dr. A. T. Henderson, Montreal.
- Treatment of infection with the newer drugs—Dr. W. Hurst Brown, Toronto.

THURSDAY, JUNE 20TH

2.15 p.m.—

- Diets in dyspepsia—Dr. Joseph Daly, Toronto.
- Pulmonary artery thrombosis—Dr. E. A. Bartram, London.
- Clinical importance and treatment of pylorospasm—Dr. D. Selater Lewis, Montreal.
- Acromegaly—case report—Dr. J. W. McCutcheon, Hamilton.
- The value of remedial exercises in treatment—Dr. Guy H. Fisk, Montreal.
- The use of apparatus in physiotherapy—Dr. W. J. Gardiner, Toronto.

FRIDAY, JUNE 21ST

2.15 p.m.—

- Complications of pernicious anæmia—Dr. Ian Macdonald, Toronto.
- The psychoneuroses—Dr. A. L. MacKinnon, Guelph.
- Epilepsy—Dr. Donald McEachern, Montreal.

Friday, June 21st—Continued

- Diuretics in the treatment of cardiac disease—Dr. John Hepburn, Toronto.
- The present status of the therapy of coronary artery disease—Dr. R. S. Stevens, Ottawa.
- The significance of gallop rhythm—Dr. F. Carlyle Hamilton, Toronto.

Section of Military Medicine

Chairman, DR. E. B. HARDY
Secretary, DR. E. S. JEFFREY

WEDNESDAY, JUNE 19TH

2.00 p.m.—

- The examination of a recruit in the army—Lt.-Col. A. R. Hagerman, R.C.A.M.C.
- Air Force: special requirements for service flying—Group-Capt. R. W. Ryan, R.A.F.
- The soldiers' documents: their value to the soldier for possible pension—Lt.-Col. W. C. Arnold, R.C.A.M.C.
- Routine chest x-ray examination of recruits: survey of results—Lt.-Col. W. A. Jones, R.C.A.M.C.

Round-table Conference:

Discussion of questions arising in papers presented.

The Director General of Medical Services, Col. R. M. Gorssline, will be present and has expressed his willingness to discuss questions relating to the Medical Services raised by members of the Association.

Section of Obstetrics and Gynecology

Chairman, DR. WILLIAM A. SCOTT
Secretary, DR. W. T. NOONAN

WEDNESDAY, JUNE 19TH

2.00 p.m.—

- Gonococcal pelvic inflammation—Dr. J. C. Goodwin, Toronto.
- Treatment of disproportion—Dr. N. D. Frawley, Toronto.
- Abortion—Dr. L. T. Armstrong, Toronto.
- Non-malignant lesions of the cervix—Dr. Leslie Watt, Toronto.
- Treatment of carcinoma of the external genitalia in the female—Dr. H. W. Johnston, Toronto.

THURSDAY, JUNE 20TH

2.15 p.m.—

- Utero-salpingography—Dr. Léon Gérin-Lajoie, Montreal.
- Gynecological disorders of puberty—Dr. Edwin Robertson, Kingston.
- Hysterectomy—vaginal and abdominal—Dr. A. D. Campbell, Montreal.
- The influence of pre-natal diet on the mother and child—Dr. J. H. Ebbs, Toronto.
- Cæsarean section—fifteen years' experience on a public ward service—Dr. D. M. Low, Toronto.

FRIDAY, JUNE 21ST

2.15 p.m.—

Pitfalls in gynaecological diagnosis—Dr. W. G. Cosbie, Toronto.

Granulosa and theca cell tumours of the ovary—Dr. D. N. Henderson, Toronto.

Essentials in technique during labour—Dr. J. R. Fraser, Montreal.

Some unusual and interesting clinical and pathological features of endometriosis—Dr. J. R. Goodall, Montreal.

The occiput posterior—Dr. Stephen Langevin, Montreal.

Section of Ophthalmology*Chairman*, DR. ALEXANDER E. MACDONALD*Secretary*, DR. L. J. SEBERT

WEDNESDAY, JUNE 19TH

2.00 p.m.—

Tuberculin as a therapeutic measure in ophthalmology—Dr. R. G. C. Kelly, Toronto.

The normal and pathological vitreous humour—Dr. T. H. Hodgson, Toronto.

Prevention and cure of lachrymation—Dr. J. A. MacMillan, Montreal.

The use of fascial sutures in the treatment of ptosis—Dr. W. W. Wright, Toronto.

Iridocyclitis with secondary glaucoma—Dr. P. B. Macfarlane, Hamilton.

THURSDAY, JUNE 20TH

2.15 p.m.—

The retina in diabetes—Dr. Gordon White and Dr. C. E. A. Hassard, Toronto.

Ophthalmic allergy—Dr. W. L. Crewson, Hamilton.

Primary sarcoma of the uveal tract—a review of 41 cases—Dr. S. H. McKee, Montreal.

Sulfanilamide in ophthalmology—Dr. J. F. A. Johnston, Toronto.

Plastic surgery of the eye-lids (motion pictures)—Dr. A. L. Morgan, Toronto.

Section of Otolaryngology*Chairman*, DR. D. E. S. WISHART*Secretary*, DR. H. H. BURNHAM

WEDNESDAY, JUNE 19TH

2.00 p.m.—

Stricture of the œsophagus—Dr. David H. Ballon, Montreal.

Analysis of results of radiotherapy of malignant diseases of the ear, nose and throat—Dr. G. E. Richards, Toronto.

Paresis of the larynx—Dr. V. R. Lapp, Hamilton.

Syphilis in the nose and throat—Dr. P. E. Ireland, Toronto.

Deafness and the endocrines—Dr. W. J. McNally, Montreal.

THURSDAY, JUNE 20TH

2.15 p.m.—

Bacteriæmia following tonsillectomy—Dr. H. W. Whytock, Hamilton.

Critique of surgical cures for deafness—Dr. E. P. Fowler, Jr., New York.

Investigation of the inferior turbinate cavernous tissue; its divisions; and its clinical significance—Dr. Howard H. Burnham, Toronto.

The use of the sound-proof room in the testing of hearing—Dr. G. E. Hodge, Montreal.

FRIDAY, JUNE 21ST

2.15 p.m.—

Symposium on atrophic rhinitis and ozæna—Drs. R. P. Wright, Montreal; J. Grant Strachan, Toronto; Angus McLeod, Toronto.

Two special instructional courses, running simultaneously.

(a) Pathology of the throat and nose—Dr. Gregor McGregor, Toronto.

(b) Pathology of the ear—Dr. P. E. Ireland, Toronto.

Exhibit by Department of Otolaryngology, at Toronto General Hospital.

Section of Pædiatrics*Chairman*, DR. ALAN BROWN*Secretary*, DR. F. F. TISDALL

WEDNESDAY, JUNE 19TH

2.00 p.m.—

Vitamin therapy and its importance in present day nutrition of childhood—Dr. F. F. Tisdall, Toronto.

Treatment of the overweight child—Dr. L. M. Lindsay, Montreal.

The prognosis in rheumatic fever and rheumatic heart disease—Dr. J. D. Keith, Toronto.

Sucking habits and deformities of the dental arches—Dr. F. H. Boone, Hamilton.

Technique in establishing the diagnosis of genito-urinary malformation—Dr. C. E. Snelling, Toronto.

Allergy in children—Dr. Gordon Chown and Dr. Elizabeth Patriarche, Winnipeg.

THURSDAY, JUNE 20TH

2.15 p.m.—

The present status of the thymus gland in pædiatric practice—Dr. E. A. Morgan, Toronto.

Problems of the adolescent child—Dr. Alton Goldbloom, Montreal.

Management of nutritional anæmia in infancy—Dr. K. L. McAlpine, London.

Disturbances of the thyroid and its relation to growth in children—Dr. John R. Ross, Toronto.

Common problems of infancy—Dr. Percy Williams, Hamilton.

FRIDAY, JUNE 21ST

2.15 p.m.—

Treatment of pneumonia in children—Dr. R. R. Struthers, Montreal.

Hypoparathyroidism in childhood—Dr. H. H. McGarry, Niagara Falls.

Sulfanilamide and sulfapyridine in the treatment of acute laryngo-tracheo-bronchitis—Dr. R. R. MacGregor, Kingston.

School health-problems and their relation to pædiatrics—Dr. Lloyd MacHaffie, Ottawa.

Convalescent serum therapy—Dr. Nelles Silverthorne, Toronto.

Section of Radiology

Chairman, DR. G. E. RICHARDS

Secretary, DR. W. J. CRYDERMAN

THURSDAY, JUNE 20TH

2.15 p.m.—

Symposium on radiological examination of the gall bladder—

1. Examination of the gall bladder—Dr. E. A. Petrie, Saint John.

2. Technical considerations in oral cholecystography—Dr. J. Somers, Toronto.

3. Correlation of clinical and radiological findings—Dr. M. R. Hall, Toronto.

Symposium on radiological aspects of cancer of the breast—

1. An analysis of published statistics in connection with mammary cancer—Dr. A. D. Irvine, Edmonton.

2. Observations on x-ray treatment with special reference to cancer of the breast—Dr. B. R. Mooney, Winnipeg.

3. Pre-operative radiation in cancer of the breast—Dr. J. E. Gendreau, Montreal.

4. Post-operative roentgentherapy in cancer of the breast—Dr. Léo Payeur, Quebec.

5. Incidence and treatment of skeletal metastases—Dr. Hugh Norman, Toronto.

FRIDAY, JUNE 21ST

2.15 p.m.—

Symposium on examination of the accessory nasal sinuses—

1. The roentgen anatomy of the paranasal sinuses—Dr. C. B. Peirce, Montreal.

2. Technique of x-ray examination of accessory nasal sinuses—Dr. C. E. Vaughan, Hamilton.

3. Correlation of clinical and radiological findings—Drs. E. M. Crawford, Montreal, and H. S. Wismer, London.

The determination of cardiac enlargement from inspiratory chest films—Dr. P. M. Andrus, London.

Friday, June 21st—Continued

The x-ray examination of the œsophagus with regard to—

1. Persistent right-sided aortic arch and some other abnormalities of the great vessels.

2. Varices—Dr. W. J. Cryderman, Toronto.

Use of the seriescope in diagnosis (movie film)—Dr. Jules Gosselin, Quebec.

Section of Rheumatic Diseases

Chairman, DR. A. A. FLETCHER

Secretary, DR. WALLACE GRAHAM

WEDNESDAY, JUNE 19TH

2.00 p.m.—

A symposium on low back pain—

Structure in relation to function—Dr. J. C. B. Grant, Toronto.

Pathology of the vertebræ and the intervertebral discs—Dr. W. L. Donohue, Toronto.

Clinical aspects of the common spinal disorders—Dr. A. A. Fletcher, Toronto.

Intervertebral disc lesions—Dr. J. Wallace Graham, Toronto.

Surgical and orthopædic treatment of the spine—Dr. W. E. Gallie, Toronto.

Physiotherapy, posture and manipulative measures—Dr. W. J. Gardiner, Toronto.

Section of Surgery

Chairman, DR. ROSCOE R. GRAHAM

Secretary, DR. F. BURNS FLEWES

WEDNESDAY, JUNE 19TH

2.00 p.m.—

Thyrotoxicosis: surgical results—Dr. Harold G. Armstrong, Toronto.

Excision of tumours of the parotid gland: exposure of the facial nerve as a preliminary procedure—Dr. Robert M. Janes, Toronto.

Empyæma in children—Dr. Edmond Dubé, Montreal.

Carcinoma of the breast—Dr. M. R. MacCharles, Winnipeg.

Indications for surgical therapy in pulmonary tuberculosis—Dr. Ross Robertson, Gravenhurst.

Investigation and treatment of painful feet—Dr. C. C. Ross, London.

THURSDAY, JUNE 20TH

2.15 p.m.—

Low back and sciatic pain caused by lesions of the intervertebral discs and ligaments—Drs. W. S. Keith and W. C. Kruger, Toronto.

Regional ileitis—Dr. Wilfrid L. Graham, Vancouver.

The management of compound fractures—Dr. F. I. Lewis, Toronto.

Treatment of fractures of the forearm—Dr. Alexander Gibson, Winnipeg.

Thursday, June 20th—Continued

The rôle of sympathectomy in the treatment of obliterative vascular disease—Dr. R. I. Harris, Toronto.

The investigation and treatment of injuries about the knee joint—Dr. Hugh R. Ink-sater, Calgary.

FRIDAY, JUNE 21ST

2.15 p.m.—

Surgery of the aged—Dr. A. W. S. Hay, Winnipeg.

Carcinoma of the œsophagus—Dr. Harold Wookey, Toronto.

Water balance in surgery—Drs. Fraser Gurd and H. Roche Robertson, Montreal.

Decompression in small bowel obstruction—Dr. D. E. Robertson, Toronto.

Surgical problems in the diabetic patient—Dr. R. A. Johnston, London.

Upper abdominal pitfalls: differential diagnosis and treatment—Dr. Geo. H. Stobie, Belleville.

Section of Urology

Chairman, Dr. J. C. McCLELLAND

Secretary, Dr. H. W. B. LOCKE

WEDNESDAY, JUNE 19TH

2.00 p.m.—

Congenital ectopic pelvic kidney—Dr. Oscar Mercier, Montreal.

Congenital anomalies as the underlying cause of persistent urinary infection—Dr. Allan B. Hawthorne, Montreal.

Pyelonephritis of pregnancy—Dr. Walter P. Hogarth, Fort William.

The management of urinary infection—Dr. Eldon D. Busby, London.

Round-Table Conference

Sterility in the male—Dr. Emerson Smith, Montreal.

Discussion by Dr. David R. Mitchell, Toronto.

THURSDAY, JUNE 20TH

2.15 p.m.—

Retroperitoneal pneumography: further results—Dr. N. W. Roome, London.

Hypertension in a girl of twelve; associated with unilateral, chronic, atrophic pyelonephritis; treated by nephrectomy—Drs. Frank S. Patch, L. J. Rhea and J. T. Codnere, Montreal.

Rupture of the kidney—Drs. Gordon S. Foulds and W. J. Reid, Toronto.

Differential diagnosis of urological conditions from abdominal lesions—Dr. S. A. Wallace, Kamloops.

Thursday, June 20th—Continued

Round-Table Conference

Hydronephrosis—Dr. Robin Pearse, Toronto.

Discussion by Drs. R. A. McComb, Toronto, and A. Strasberg, Montreal.

FRIDAY, JUNE 21ST

2.15 p.m.—

The present status of the prevention and solution of urinary calculi, and a preliminary report of experimental work—Drs. Karl Sternbach and Ross Flett, Toronto.

Urinary incontinence in women—Dr. Magnus I. Seng, Montreal.

Treatment of vesico-vaginal fistula—Dr. William Hutchinson, Ottawa.

Obstructions at the vesical neck—Dr. Ralph Powell, Montreal.

Cystitis emphysematosa—with report of three fatal cases following prostatic resection—Dr. E. R. Hall, Vancouver.

Indications for decapsulation of the kidney—Dr. J. E. Nichol, Toronto.

SCIENTIFIC EXHIBITS

1. X-ray aids in pregnancy—Drs. E. A. Mowry and M. C. Morrison, London, Ont.
2. Cultures demonstrating ophthalmic bacteria—Drs. S. Hanford McKee and L. J. Rhea, Montreal.
3. Surgical collapse therapy in pulmonary tuberculosis—Drs. Fraser B. Gurd, Arthur M. Vineberg and Douglas Ackman, Montreal.
4. Arthritis and rheumatism—Dr. Douglas Taylor, Montreal.
5. Esophageal lesions as demonstrated by x-ray—Dr. W. J. Cryderman, Toronto.
6. Stored blood for transfusion—Dr. L. T. Barelay, Toronto.
7. Demonstrability of peptic ulcer and gastric cancer—Drs. E. H. Shannon and W. M. McCutcheon, Toronto.
8. Lesions of the cervix uteri—Dr. George Hendry, Toronto.
9. Water and salt metabolism—Dr. Angus MacKay, Toronto.
10. Sodium chloride and its relation to body fluids—Drs. R. A. Cleghorn and J. K. W. Ferguson, Toronto.
11. Blood vessels of the lateral nasal wall with relation to turbinates and sinuses, and some of the clinical applications—Dr. H. Burnham, Toronto.
12. Lesions of the intervertebral discs—Dr. W. L. Donohue, Toronto.

Scientific Exhibits—Continued

13. (a) Air sterilization—Dr. E. Chant Robertson, Toronto.
 (b) Heart disease—Dr. John Keith, Toronto.
14. Extrusion of intervertebral disc—Drs. K. G. McKenzie, G. E. Richards and E. H. Botterell, Toronto.
15. Metropolitan Life Insurance Company, Ottawa, Ont.

COMMERCIAL EXHIBITORS

Abbott Laboratories, Ltd.	Montreal, Que.
Acousticon Dictograph Co. of Canada	Toronto, Ont.
Armour & Company	Chicago, Ill.
Ayerst, McKenna & Harrison Ltd.	Montreal, Que.
Bard-Parker Company, Inc.	Danbury, Conn.
Becton Dickinson & Co.	Rutherford, N.J.
Borden Company Limited	Toronto, Ont.
Bristol Myers Co. of Canada	Montreal, Que.
Burke Electrical & X-Ray Co.	Toronto, Ont.
S. H. Camp & Company	Jackson, Mich.
Canada Starch Co. Limited	Montreal, Que.
Canadian Cannery Ltd.	Hamilton, Ont.
Canadian Industries Ltd.	Montreal, Que.
Canadian Kodak Co.	Mount Dennis, Ont.
Carnation Company	Milwaukee, Wisc.
Ciba Company Ltd.	Montreal, Que.
Coca-Cola Company of Canada, Ltd.	Toronto, Ont.
Denver Chemical Co.	New York, N.Y.
Depuy Manufacturing Co.	Warsaw, Ind.
Devereux Schools Inc.	Berwyn, Pa.
Doho Chemical Corp.	New York, N.Y.
Eli Lilly & Company	Toronto, Ont.
Ferranti Electric Limited	Mount Dennis, Ont.
Foregger Co. Inc.	New York, N.Y.
Charles E. Frosst & Co.	Montreal, Que.
J. F. Hartz Co. Limited	Toronto, Ont.
H. J. Heinz Co.	Toronto, Ont.
John A. Huston Company, Ltd.	Toronto, Ont.
Ingram & Bell Limited	Toronto, Ont.
Laboratory Poulenc Frères of Canada, Ltd.	Montreal, Que.
Lederle Laboratories Inc.	Montreal, Que.
Lehn & Fink (Canada) Limited	Toronto, Ont.
Mead, Johnson & Company	Bellefonte, Ont.
Mennen Company, Limited	Newark, N.J.
Merk & Co. Limited	Montreal, Que.
Milgo Limited	Hamilton, Ont.
Macmillan Co. of Canada	Toronto, Ont.
Ohio Chemical & Mfg. Co.	Cleveland, Ohio.
Parke Davis & Co.	Walkerville, Ont.
Chas. H. Phillips Chemical Co.	Windsor, Ont.
Pickering X-Ray of Canada Ltd.	Toronto, Ont.
Reckitts (Oversea) Limited	Montreal, Que.
Schering (Canada) Ltd.	Montreal, Que.
Sharp & Dohme	Philadelphia, Pa.
Smith, Kline & French Laboratories	Philadelphia, Pa.
E. R. Squibb & Sons of Canada Limited	Toronto, Ont.
Taylor Instrument Co.	Toronto, Ont.
Charles C. Thomas	Springfield, Ill.
Victor X-Ray Corp. of Canada	Montreal, Que.
A. Wander Limited	Peterborough, Ont.
Wm. B. Warner Co. Ltd.	Toronto, Ont.
White Laboratories Inc.	Newark, N.J.
Wingate Chemical Co.	Montreal, Que.
Winthrop Chemical Co.	Montreal, Que.
John Wyeth & Brother	Walkerville, Ont.

CANADIAN MEDICAL ASSOCIATION**Constitution and By-Laws**

Approved in General Council June 20, 1939

(Second Printing)

CONSTITUTION**ARTICLE I.—TITLE**

This Association shall be known as The Canadian Medical Association, and when the French language is used, it shall be known as "L'Association Médicale Canadienne".

ARTICLE II.—OBJECTS

1. The promotion of health and the prevention of disease.
2. The improvement of medical services however rendered.
3. The maintenance of the integrity and honour of the medical profession.
4. The performance of such other lawful things as are incidental or conducive to the welfare of the public and of the medical and allied professions.

ARTICLE III.—ETHICS

The Code of Ethics of The Association shall be such as may be adopted by The Association from time to time. A copy shall be supplied to each member of The Association.

ARTICLE IV.—MEMBERSHIP

The Association shall be composed of ordinary members, members-at-large, senior, non-resident and honorary members, elected by the method set forth in the By-Laws.

ARTICLE V.—BRANCH ASSOCIATIONS AND DIVISIONS

Each Provincial Medical Association, or the body representing organized medicine in a province and enjoying all the rights and privileges of a medical association, may be recognized as a Branch Association, but any Branch Association, if it so desire, may change its relationship to The Canadian Medical Association and become a Division by the method set forth in the By-Laws. It shall then be known as The Canadian Medical Association (name of Province) Division.

ARTICLE VI.—AFFILIATED SOCIETIES

Any nationally or internationally organized medical, scientific, or sociological body may, subject to the approval of the General Council, become affiliated with The Canadian Medical Association. Affiliation shall be understood to imply the establishment of a friendly relationship with the affiliated organization. There shall be no obligation on the part of either party to the affiliation to sponsor policies or movements on the part of the other.

ARTICLE VII.—MEETINGS

The meetings of The Association shall be held in whole or in part on such occasions as may be provided for in the By-Laws.

ARTICLE VIII.—OFFICERS**(a) The Patron.**

(b) The elective officers of The Association shall be a President, a President-Elect, a Chairman of the General Council, and an Honorary-Treasurer.

(c) The appointive officers of The Association shall be a General Secretary and such other officers as may be appointed by the Executive Committee. The appointive officers shall have no voting power.

ARTICLE IX.—THE GENERAL COUNCIL

The General Council shall consist of:—

- (a) The officers of The Association.
- (b) The President and Secretary or Joint Secretaries of each Branch Association or Division.
- (c) Delegates elected by Branch Associations and Divisions amongst whom shall be included the members designated by Divisions for the Nominating Committee and The Executive Committee.

Each Branch Association or Division shall be entitled to elect five delegates to serve on the General Council for its membership in The Canadian Medical Association of fifty or less; one additional delegate for its membership from 51 to 100; one additional delegate for its membership from 101 to 300; and thereafter one delegate for every 300 above 300. One of its representatives on Council may be named by a Division as its nominee to the Nominating Committee of the Association.

(d) The chairmen of the Standing Committees of The Association.

(e) Past-Presidents of The Association.

(f) Two representatives of the Department of Pensions and National Health, who are members of The Canadian Medical Association, one of whom shall be the Deputy Minister of Pensions and National Health.

ARTICLE X.—COMMITTEES

The Committees shall be (a) Standing; (b) Special.

(a) The Executive Committee shall be elected by the General Council; the other standing committees shall be appointed by the Executive Committee.

The standing committees are as follows:—

1. The Executive Committee.
 2. The Committee on Legislation.
 3. The Committee on Medical Education
 4. The Post-Graduate Committee.
 5. The Central Program Committee.
 6. The Committee on Constitution and By-Laws.
 7. The Committee on Archives.
 8. The Committee on Public Health.
 9. The Committee on Ethics and Credentials.
 10. The Committee on Economics.
 11. The Committee on Pharmacy.
 12. The Committee on Hospital Service.
 13. The Cancer Committee.
 14. The Committee on Maternal Welfare.
 15. The Committee on Nutrition.
- (b) Special Committees may be appointed by—
- (i) The President.
 - (ii) The General Council.
 - (iii) The Executive Committee.
 - (iv) The Chairman of the General Council.

ARTICLE XI.—FUNDS

Funds for the purpose of The Association shall be raised in such manner as may be determined by the General Council.

ARTICLE XII.—THE ASSOCIATION YEAR

The Association year shall be the calendar year.

ARTICLE XIII.—AMENDMENTS

1. Notice of Motion by one or more members to amend the Constitution must be placed in the hands of the General Secretary six months before the date of the annual meeting.

2. Amendments may be proposed by the General Council, the Executive Committee, or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

3. The Constitution shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

ARTICLE XIV.—PROVINCIAL AUTONOMY

No provision of the Constitution or By-Laws herein set forth shall interfere with the status of a Branch Association or Division as a provincial organization. As a provincial body it shall have complete control of its own affairs. In the case of a Division, if it choose, it may retain its present name, as well as being known as Canadian Medical Association (name of Province) Division.

BY-LAWS

CHAPTER I.—DIVISIONS

A Branch Association may become a Division as outlined in Article V of the Constitution and enjoy all the rights and privileges of a Division in the following manner:—

1. By intimating to The Canadian Medical Association in writing that it desires to become a Division.

2. By agreeing to amend where necessary its Constitution and By-Laws to place them in harmony with the Constitution and By-Laws of this Association.

3. By agreeing to collect from all of its Divisional Members who desire to be members of The Canadian Medical Association such annual fee as may from time to time be set for membership and remit same to this Association.

4. By agreeing to take such steps as seem proper to the Division to increase membership in The Association.

CHAPTER II.—MEMBERSHIP

Section 1—Ordinary Members

Every Member in good standing in a Branch Association or a Division shall be automatically an ordinary Member of the Canadian Medical Association on payment of the annual fee as levied by the General Council.

Section 2—Members-at-Large

Any graduate in Medicine residing in Canada, who is not a Member of a Branch Association or of a Division may be accepted as a Member of The Canadian Medical Association provided that, with his application, a certificate of approval from the executive body of the Branch Association or Division in the Province in which the applicant resides be furnished to the General Secretary. In the case of an applicant residing in Canada in a territory beyond the jurisdiction of a Branch Association or of a Division, the application must be endorsed by two Members of The Canadian Medical Association. Such Members shall be designated "Members-at-Large" and shall pay the annual fee as levied by the General Council.

Section 3—Senior Members

Any Member of The Association in good standing for the immediately preceding ten-year period who has attained the age of seventy years is eligible to be nominated for Senior Membership by an ordinary member of The Association. He may be elected only by the unanimous approval of the members of the Executive Committee in session present and voting. Not more than ten such Senior Members may be elected in any one year. Senior Members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 4—Non-Resident Members

Non-Resident Members may be elected by the Executive Committee from regularly qualified practitioners residing outside of Canada. They shall be required to pay not more than seventy-five per cent of the annual fee as levied by General Council.

Section 5—Honorary Members

Honorary Members may be nominated by any Member of The Association and shall be elected only by a unanimous vote of the Executive Committee or the

General Council in session present and voting. Not more than five Honorary Members may be elected in any one year and at no time shall the list of living Honorary Members exceed twenty-five. Honorary Members shall enjoy all the rights and privileges of The Association, but shall not be required to pay any annual fee.

Section 6—Discipline of Members

Any Member failing to conform to the Constitution and By-Laws and/or Code of Ethics shall be liable to censure, suspension or expulsion.

(a) Any Member whose annual fee is directly payable to The Canadian Medical Association and whose annual fee has not been paid on or before the 31st day of March of the current year, may, without prejudice to his liability to The Association, be suspended from all privileges of membership.

(b) Any Member who has been found guilty of unprofessional conduct may, upon representation of the facts to the General Council, be censured, suspended or expelled from The Canadian Medical Association.

Section 7—Restoration to Membership

A Member, suspended or expelled, shall not be restored to membership until all arrears of fees (if directly payable to The Canadian Medical Association) have been paid, or until such requirements as may be determined by the General Council or the Executive Committee have been met.

Section 8—Resignation from Membership

Membership in The Association shall automatically cease only on suspension, expulsion or death. Resignation may be effected (1) in the case of a member of a Division by giving notice to the Secretary of the Division not less than one month before the beginning of the calendar year; (2) in the case of a member of a Branch Association or in the case of a Member-at-Large by giving notice directly to the General Secretary of The Canadian Medical Association one month before the next annual fee is due.

Section 9—Registration at Meetings

No Member shall take part in the proceedings of The Canadian Medical Association or in the proceedings of any of the Sections thereof or attend any part of the meeting until he has properly registered. Only Members and invited guests are eligible to register and attend an annual meeting.

CHAPTER III.—GUESTS AND VISITORS

Section 1—Visitors from outside of Canada

Medical practitioners and other men of science residing outside of Canada may attend the annual meeting as guests of the President or of the General Council, or as visitors when vouched for by the General Secretary. They shall register with the General Secretary without payment of fee and may, after proper introduction, be allowed to participate in discussions.

Section 2—Medical Students attending Meetings

Any hospital intern or medical student, when properly vouched for, may be admitted as a guest to the scientific meetings but shall not be allowed to take part in any of the proceedings unless specially invited by the Committee on Program to present a communication.

Section 3—Delegates from Affiliated Societies at Scientific Meetings

Two delegates from each affiliated society, one only of whom is required to be a Member of this Association, may attend the scientific meetings.

Section 4—Delegates from Affiliated Societies at Meetings of General Council

Two delegates from each affiliated society, provided one delegate is a Member of this Association, may be invited by the Executive Committee to attend meetings of the General Council. They may, at the request of the Chairman, take part in the deliberations but shall have no voting power.

CHAPTER IV.—ANNUAL MEETINGS

Section 1—Time and Place of Meetings

The time and place of meetings shall be decided by the General Council or the Executive Committee, and shall be announced as early as possible.

Section 2—Arrangements for Annual Meetings

When The Canadian Medical Association meets in any province where there is a Branch Association or Division, the meeting of that Branch Association or Division for that year shall be for business purposes only. The local arrangements shall be under the direction of the Executive Committee of The Canadian Medical Association, which may enlist the assistance of the Branch Association or Division or one of its component societies. The Canadian Medical Association assumes full control of the proceedings of the meeting and of all financial obligations save entertainment.

Section 3—Type of Program

The program of the meeting may consist of business sessions, general and sectional scientific sessions, and any other sessions which may be decided upon by the Executive Committee.

Section 4—Presiding Officer

The President or some person designated by him shall preside at all general meetings.

Section 5—Rules of Order

The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of The Association.

CHAPTER V.—MEETINGS OF SECTIONS

Section 1—Sectional Scientific Sessions

The Executive Committee shall determine what scientific Sections shall hold sessions at any annual meeting.

Section 2—Appointment of Sectional Officers

The Chairman and Secretary for each scientific Section shall be appointed by the Executive Committee.

Section 3—Presiding Officers at Meetings of Sections

The Chairman of the Section, or some one designated by him, shall preside at all meetings of the Section.

Section 4—Duties of Secretaries of Sections

The Secretary of the Section shall keep a correct record of the transactions and shall transmit it to the General Secretary for insertion in the Minute Book provided for the purpose.

CHAPTER VI.—OFFICERS AND EXECUTIVE COMMITTEE

Section 1—Appointment of Nominating Committee

(a) The General Council at its first session at the time of the annual meeting shall elect by ballot from among its members present a Nominating Committee of NINE not including the President who shall be *ex officio* a member of the Committee and Chairman thereof.

(b) Each Division in The Association is entitled to appoint from amongst its delegates to General Council one member to the Nominating Committee. Provided this nomination be made in writing to the General Secretary prior to the annual meeting and the delegate so nominated be present he shall be declared elected to membership on the Nominating Committee.

(c) Upon completion of the election of Divisional Representatives as provided for in clause (b) of this section any vacancies which remain shall be filled by nominations from the floor. The list so nominated shall contain the name of at least one member of each Branch Association represented at this session. The candidate of a Branch Association who obtains the highest vote amongst the candidates of that Branch Association shall be declared elected. The remaining members, if any, shall be declared elected by majority vote. This election shall be declared on a single ballot and the Chairman of General Council shall if necessary give the casting vote or votes.

Section 2—Duties of Nominating Committee

The Nominating Committee shall meet on the day of its election and submit to a later session of the General Council:—

1. Nomination of the following officers of The Association: a President-Elect, a Chairman of the General Council and an Honorary-Treasurer.

2. Nomination of an Executive Committee which, in addition to those who are members *ex officio* (See Chapter VIII, Section 4), shall consist of thirteen members drawn from General Council and geographically distributed as follows: three shall be resident in each province in which an office of The Association is located and one shall be resident in each of the other provinces.

At its session, the Nominating Committee may receive in writing a Division's official nomination of the candidate or candidates for representation on the Executive Committee to which the Division is entitled. In the event of an official nomination being rejected by the Nominating Committee the reasons for such action shall be incorporated in its report to General Council.

3. *Rules of Procedure.*—The Committee shall be called to order by the President as Chairman of the Committee. In the absence of the President the General Secretary shall convene the Committee and request the Committee to select, by open vote, the Chairman. The Committee shall then proceed to carry out its duties by open vote. In case of a tie vote the Chairman shall have the casting vote in addition to the vote to which he is entitled as a member of the Committee. When called for, the report of the Committee shall be presented to the General Council by the General Secretary.

Section 3—Election of Officers and Executive Committee

When the report of the Nominating Committee has been received by the General Council in session, other nominations may also be received from the floor. A ballot shall then be taken for each of the offices in turn and also for elective membership of the Executive Committee by provinces.

CHAPTER VII.—DUTIES OF OFFICERS

Section 1—Duties of the President

The President shall preside at the general sessions of The Association and shall perform such duties as custom and parliamentary usage require. He shall deliver a presidential address. He shall be a member *ex officio* of all committees of The Association. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 2—Duties of the President-Elect

The President-Elect shall be installed and shall assume the office of President at the first general session of the Annual Meeting next following his election to the office of President-Elect. He shall be a member *ex officio* of all committees of The Association excepting the Nominating Committee. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

Section 3—Duties of the Chairman of the General Council

The Chairman of the General Council shall preside at all meetings of the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association. He shall be a member *ex officio* of all Committees, excepting the Nominating Committee.

Section 4—Duties of the Honorary-Treasurer

The Honorary-Treasurer shall be the custodian of all moneys, securities and deeds, which are the property of The Association.

He shall pay by cheque only. Such cheques shall be signed by two persons authorized by the Executive

Committee to sign cheques of The Association and shall be covered by voucher.

He shall prepare an annual financial statement audited by a chartered accountant.

He shall furnish a suitable bond for the faithful discharge of his duties. The cost of the bond shall be borne by The Association.

He may receive for his services an honorarium to be determined by the General Council. He shall be reimbursed for his legitimate travelling expenses while engaged in the business of The Association.

He shall be a member *ex officio* of the Executive Committee.

Section 5—Duties of the General Secretary

The General Secretary shall be the Secretary also of the General Council and of the Executive Committee of The Association. He shall also be a member *ex officio* of all Committees of The Association. He shall give due notice of the time and place of all annual and special general meetings, by publishing the same in the official *Journal* of The Association, or, if necessary, by notice to each member. He shall keep the minutes of the meetings of the General Council and of the Executive Committee in separate books and shall provide minute books for the secretaries of the different sections which he shall require to be properly attested by the secretaries thereof. He shall notify the officers and members of committees of their appointment and of their duties in connection therewith. He shall publish the official program of each annual meeting. He shall perform such other duties as may be required of him by the President, the General Council or the Executive Committee. All his legitimate travelling expenses shall be paid for him out of the funds of The Association and he shall receive for his services a salary to be determined by the Executive Committee.

CHAPTER VIII.—THE GENERAL COUNCIL

Section 1—Meetings of the General Council

The General Council shall meet for at least the first two days of the annual meeting of The Association and thereafter, while The Association is in session, at the call of the Chairman. Before the close of the annual meeting it shall elect the officers and the Executive Committee and select the place for the next annual meeting, or, if thought advisable, for meetings up to three years in advance.

Section 2—Special Meetings of General Council

During the interval between annual meetings the General Council shall meet at the call of the Executive Committee. For all such meetings of the General Council due notice shall be sent to each member, stating the purpose of the meeting. The Executive Committee, if it so decide, instead of calling such meetings of the General Council may refer important questions to the General Council and obtain its decision by means of a mail ballot. In the event of a mail ballot being taken, two-thirds majority vote shall govern.

Section 3—Duties of the General Council

The General Council shall have supervision of all properties and of all financial affairs of The Association. It shall, through its officers, conduct all business and correspondence, and shall keep a record of all meetings and the receipt and expenditure of all funds, and shall report upon same in the *Journal* after the annual meeting.

Section 4—The Executive Committee may Act for the General Council

In order that the business of The Association may be facilitated during the interval between meetings of the General Council the Executive Committee shall meet from time to time at the call of its Chairman, and shall have all the rights and powers of the General Council. It shall conduct all necessary business. In case of a vacancy in any office on account of death or otherwise it shall have power to appoint a successor. In case of a vacancy occurring in the Executive Committee itself

by death or otherwise, it shall have power to appoint a successor upon receiving an official nomination from the Branch Association or Division concerned.

The President, the President-Elect, the Chairman of the General Council, the Honorary-Treasurer, the General Secretary, the Editor and the Managing Editor shall be members *ex officio* of the Executive Committee, but only the elective officers shall have the right to vote.

CHAPTER IX.—COMMITTEES

Section 1—Duties and Powers of the Executive Committee

The Executive Committee shall hold one or more sessions before the close of the annual meeting at which it is elected. At its first meeting it shall elect its Chairman and appoint the Chairmen of the Standing Committees for the ensuing year. Between the meetings of the General Council, the Executive Committee shall represent the General Council in all its business affairs and shall exercise all the rights and powers of the General Council. The Executive Committee shall report to the General Council at the annual meeting and at such other times as the Chairman of the General Council may request.

The Executive Committee may meet when and where it may determine. On the request in writing of any three members (with voting power) of the Executive Committee, the Chairman shall call a special meeting. Seven members (with voting power), exclusive of the Chairman, shall constitute a quorum for the transaction of business.

The Executive Committee shall be responsible for the appointment of the General Secretary, the Editor, the Managing Editor, the Associate Secretaries, and any other appointive officers, and shall fix their salaries.

The Executive Committee shall have charge of the publication of the official *Journal* of The Association and of all published proceedings, transactions, memoirs, essays, papers and programs of The Association.

The Editor and Managing Editor shall present annual reports to the General Council and interim reports at each meeting of the Executive Committee. The Editor shall be reimbursed for his legitimate travelling expenses incurred on Association business.

The Executive Committee may appoint Editorial Boards to assist the Editors.

The Executive Committee shall appoint the auditor and shall have the accounts of the Honorary-Treasurer audited annually, or more often if desirable, and shall make an annual report on the same to the General Council.

Each member of the Executive Committee shall be reimbursed for his legitimate travelling expenses incurred in attending meetings of the Executive Committee other than the first meeting or meetings of the new Executive Committee, which may be held before the close of the annual meeting.

Section 2—Committee on Legislation

Matters relating to medical legislation, Federal or Provincial, and matters requiring legislative action arising within The Association, may be referred by the Executive Committee to the Committee on Legislation for consideration and advice.

Section 3—Committee on Medical Education

To the Committee on Medical Education shall be referred all matters pertaining to medical colleges and medical education. It shall report upon the condition of medical education throughout Canada and upon any proposed change, and may suggest methods for the improvement of medical education.

Section 4—Post-Graduate Committee

To the Post-Graduate Committee shall be delegated the responsibility of carrying out the post-graduate plans of The Association.

Section 5—Committee on Program

This Committee, with the assistance of the Chairman and Secretary of each scientific section, shall have complete charge of the preparation of the scientific program for the annual meeting.

Section 6—Committee on Constitution and By-Laws

To the Committee on Constitution and By-Laws shall be referred all matters relating to the subject before action thereon is taken by the General Council.

Section 7—Committee on Archives

The Committee on Archives shall be responsible for collecting as far as possible (a) the obituaries of members dying since the last annual meeting; (b) all documents and information relating to the various members and activities of The Canadian Medical Association which are deemed worthy of preservation. The Editor of the *Journal* shall be a member *ex officio* of this Committee.

Section 8—Committee on Public Health

It shall be the duty of this Committee to study and report upon all matters of Public Health which, in the opinion of the Committee, should engage the attention of The Association. To the Committee may be delegated such duties in relation to Public Health as in the opinion of General Council or Executive Committee should be undertaken by the Committee on behalf of The Association.

Section 9—Committee on Ethics and Credentials

To this Committee all matters of ethics and special questions of credentials shall be referred for consideration and report to the General Council or the Executive Committee.

Section 10—Committee on Economics

It shall be the duty of the Committee on Economics, excepting where otherwise provided, to deal with (a) social legislation which includes medical services or benefits presumably for medical services; (b) remuneration and employment of physicians by lay bodies, hospital or official bodies, including Federal, Provincial and Municipal Governments; (c) to report thereon with such recommendations as it may see fit to the General Council.

Section 11—Committee on Pharmacy

It shall be the duty of the Committee on Pharmacy to deal with (a) all matters arising out of the British Pharmacopoeia or any Canadian Formulary or Pharmacopoeia; (b) all matters arising out of the drug section of the Food and Drugs Act, the Narcotic Act, or the Patent and Proprietary Medicine Act, and (c) any inquiries from members of The Association relating to the use or standards of drugs.

Section 12—Hospital Service Committee

This Committee shall act in an advisory capacity to the Hospital Service Department of The Association.

Section 13—Committee on Cancer

This Committee shall act in an advisory capacity on all matters relating to the study and control of cancer.

Section 14—Committee on Maternal Welfare

To this Committee shall be referred for consideration all matters concerning maternal welfare. It shall be the duty of the committee to devise and recommend to General Council ways and means for the reduction of maternal mortality and the improvement of maternal welfare.

Section 15—Committee on Nutrition

It shall be the duty of the Committee on Nutrition, subject to the approval of the Executive Committee, (a) to initiate studies upon the nutritional needs of the public of Canada; (b) upon request from public bodies,

to act in an advisory capacity upon nutritional problems; and (c) to adopt measures, educational or otherwise, likely to improve the nutritional standards of the public of Canada.

Section 16—Special Committees

Each Special Committee shall assume, by direction, such duties as are allotted to it, and shall make progress reports to the Executive Committee at each of the meetings of that body or at any other time that such reports may be required by the President, the Chairman of the General Council, or the Executive Committee.

Section 17—Reports of Committees

Reports of all Committees shall be printed and mailed to all members of the General Council at least one week before the annual meeting.

Section 18—Limitations of Committees re Finances

No Committee shall expend any moneys or incur any indebtedness or obligation on behalf of The Association without the sanction of the General Council or the Executive Committee.

CHAPTER X.—ADDRESSES AND PAPERS

Section 1—Addresses at Annual Meeting

All addresses delivered at an annual meeting shall immediately become the property of The Association, to be published or not, in whole or in part, as deemed advisable, in the *Journal* of The Association. Any other arrangements for their publication must have the consent of the author or of the reader of the same and of the Editor of the *Journal*.

Section 2—Publication of Papers Presented at Annual Meeting

All papers, essays, photographs, diagrams, etc., presented in any section shall become the property of The Association, to be published in the *Journal* of The Association or not, as determined by the Editor, and they shall not be otherwise published except with the consent of the author and of the Editor of the *Journal*.

Section 3—Disposition of Papers Presented at Annual Meeting

Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the Section before which it has been presented. The Secretary shall endorse thereon the fact that it has been read in that Section, and shall then transmit it to the Editor of the *Journal*.

CHAPTER XI.—PROVISIONS FOR DISCIPLINE

Section 1—If any Member of The Association, after due inquiry by the Executive Committee shall be judged to have been guilty of disgraceful conduct in any professional respect, he shall be liable to censure, suspension or expulsion from membership in The Association by resolution of the Executive Committee, confirmed by a three-fourths vote at the next annual meeting of General Council.

Section 2—Should any Member of The Association be convicted of any criminal offence, or have his name removed from the register of the Medical Council of Canada, or of the licensing body of any Province of Canada, because of felonious or criminal act, or disgraceful conduct in any professional respect, the Executive Committee may, by resolution, confirmed at the next ensuing annual meeting of the General Council, by a three-fourths vote of those present, censure, or suspend, or expel such persons from Membership in The Association.

Section 3—Any Member suspended or expelled by resolution, as aforesaid, shall thereby forfeit all his rights and privileges as a Member of The Association.

Section 4—Any Member suspended or expelled by resolution as aforesaid shall, subject to conditions imposed by the Executive Committee, be restored to membership upon resolution of the Executive Committee, confirmed at the next ensuing annual meeting of General Council.

Section 5—By subscribing to the application for membership under the terms of the By-Laws and Code of Ethics and becoming a Member of The Association, every Member attorns to these By-Laws, and agrees to such right of discipline as aforesaid, and thereby specifically waives any right or claim to damages in the event of his being so disciplined.

CHAPTER XII.—AMENDMENTS

Section 1—Notice of Motion by one or more Members, to amend the By-Laws, must be placed in the hands of the General Secretary three months before the date of the annual meeting.

Section 2—Amendments may be proposed by the General Council, the Executive Committee, or the Committee on Constitution and By-Laws without notice of motion, but the proposed amendments shall be published in the *Journal* in two issues preceding the annual meeting.

Section 3—The By-Laws shall be amended by a two-thirds vote of the members of the General Council in session present and voting.

CHAPTER XIII.—THE OFFICE

Until changed by General Council the offices of The Association shall be at Toronto and Montreal.

NOTE: Throughout these By-Laws, masculine designations are to be interpreted as including feminine.

The Cancer Campaign

The Canadian Society for the Control of Cancer

On all home fronts forces are being mobilized to combat what is presently one of the major problems facing medical science. While one appreciates that any effective program on cancer control must be designed to carry on over a period of years, yet it is interesting to note that scarcely a month passes by that some outstanding announcement is not made concerning one or more phases of research or treatment.

Perhaps the most important function of the Canadian Society for the Control of Cancer is to translate such announcements into simple lay language, which may be passed on to the general public in such manner as to arouse a spirit of hope.

Greater understanding of the function of cancer and the effective treatment thereof can be of little use either to doctor or patient if that understanding remains the private and personal property of medical men. Unless and until such time as the masses become thoroughly familiarized with the action of cancerous cells with the more common, easily-recognized symptoms of different types of cancer and the methods of treatment fully recognized as a

means of cure, cancer control programs will not be functioning in their most efficient manner.

There is a wide gap between those thoroughly equipped to bring relief and those so afflicted as to require that relief. It is to bridge that gap that an organized group such as ours is able to justify its existence. In appreciation of the necessity for close co-operation between the medical profession and educational agencies, it is gratifying indeed to note that an increasing number of doctors are actively joining in the work of the Canadian Society. We look for this happy condition to obtain throughout the coming years.

DON G. McMASTER,
Secretary.

Medical Societies

Calgary District Branch

A meeting of the Calgary District Branch of the Canadian Medical Association, Alberta Division, was held in the Holy Cross Hospital, May 8, 1940. Dr. F. T. Campbell, President-elect of our association, made suggestions whereby the rank and file of our members should become more interested in the work carried on by our organization.

Dr. Huckell, of the University of Alberta, gave an address on the treatment of low-back pain.

Dr. Irving Bell, also of the University of Alberta, discussed the use of drugs in the treatment of cardiovascular disease. G. E. LEARMONTH

Calgary Medical Society

At the regular meeting of the Calgary Medical Society, held in the Holy Cross Hospital, on April 9, 1940, three papers were read in a symposium on hæmorrhage during pregnancy and the puerperium.

Dr. A. J. Fisher contributed one on "Bleeding in the first trimester of pregnancy". He classified the various causes of bleeding and dealt with abortion more particularly, the most important cause at this period. Dr. W. R. Dunlop discussed bleeding in the third trimester, including incidental hæmorrhage and placenta prævia. Dr. Clara Christie spoke about postpartum hæmorrhage.

This was the annual meeting of the Calgary Medical Society and the following officers were elected for 1940-41: *President*—Dr. W. E. Ingram; *Vice-president*—Dr. L. M. Mullen; *Secretary*—Dr. Fred Pilcher; *Treasurer*—Dr. J. V. Follett.

Executive Committee—Drs. H. N. Jennings, I. H. Brodie, R. W. Boyd, M. G. Cody.

Librarian—Dr. R. R. Hughes; *Library Committee*—Drs. W. W. Upton, A. E. Wilson, G. O. Prieur.

Dr. M. G. Cody, the retiring president, delivered an address.

Canadian Association of Radiologists

The Eastern Canada mid-winter session of this Association was held in Quebec, January 6th to 8th, with an attendance of 30.

The following is a summary of papers presented on that occasion.

TREATMENT OF CARCINOMA OF THE TONGUE.—J. E. Gendreau and O. Dufresne, Montreal.

With the advent of irradiation the prognosis of carcinoma of the tongue has been favourably modified. In our experience Curiepuncture with needles is the most satisfactory for treatment of cancer of the tongue when it is practicable. The treatment of the submental, submandibular and jugular adenopathies, which are often associated with carcinoma of the tongue, raises a difficult problem. Successful treatment of glandular metastases has followed Curietherapy, deep roentgentherapy, and complete surgical extirpation of the glands.

Although extirpation following Roux Berger's method, seems to be more universally adopted, we have always used interstitial and surface irradiations, especially deep roentgentherapy, in suspicious cases, in cases where the glands are definitely enlarged and movable and also in far advanced cases with fixed adenopathies. Out of 42 cases of cancer of the tongue, treated exclusively by irradiation (interstitial and surface), 11 cases (25 per cent) are cured from seven to twelve years; 7 did not show any adenopathy, while 5 presented, clinically, cancerous submaxillary glands.

GALL STONES AND MEDICATION.—L. Minto, Montreal.

A woman, aged forty, following a fall, reported for x-ray examination and incidentally a gall bladder containing twenty-five big stones was found. As the patient had suffered no symptoms she refused operation and was treated medically with pancrobin. Three years later a second radiograph taken in May, 1936, showed stones less dense and lying in the form of a pearl necklace. Medical treatment was continued and no stones were seen in films taken in August, 1937, and in June, 1939.

SERIESCOPY.—J. Gosselin, Quebec.

This new method of vertical and lateral stereo-roentgenograms is extensively used in examination of tuberculous lungs in Laval Hospital. The movies presented were chosen from a hundred cases which best show the application of this method. It can be used for the demonstration and localization of cavities

and pleural adhesions in the respiratory tract. A few cases illustrate the possibility of showing cavities in parts of the lung that could not be demonstrated in standard films.

PRIMARY TUMOURS OF BONE.—M. C. Morrison, London.

The salient features of primary tumours of bone were illustrated by history, roentgenographic and pathological findings in 20 cases.

Next to biopsy the roentgenogram is, no doubt, the most important single means of diagnosis, and in certain lesions, such as Ewing's sarcoma and giant-cell tumour, it may be more accurate than the pathologist's report on microscopic examination of tumour tissue.

Classification of bone tumours based on histogenesis is not entirely satisfactory from a roentgenological standpoint, due to a lack of uniformity of opinion regarding the histological appearance and frequent discrepancies between the pathological findings, radiographic appearance, and radiotherapeutic response. Consideration should be given to the formation of a radiological classification.

THE RADIOLOGICAL EXPLORATION OF THE MUCOSAL RELIEF OF THE STOMACH.—Albert Jutras, Montreal.

The gastric rugæ and furrows may be evidenced by using a thin, opaque coating or by compression of the stomach; the latter being easier and more valuable, provided the proper equipment is used. The study of the mucosal relief is complementary to such methods as the analysis of the contours, muco-membranous folds, and peristalsis as shown by opaque filling, radioscopy and serial radiography. In chronic gastritis the findings are very indefinite and enlarged normal or diminished folds may be present in hypertrophic and in atrophic gastritis. The best sign of hypertrophic gastritis is polyposis and this is very rare. In atrophic gastritis easy disappearance of the folds with small filling and slight compression is a reliable sign. The diagnosis of chronic gastritis must be left to gastroscopy.

Compression technique is an aid in discriminating between benign and malignant tumours and in distinguishing a benign tumour from a cancer but it must be supported by the usual x-ray methods.

A COMPARISON OF CLINICAL, X-RAY, AND OPERATIVE FINDINGS IN SINUSITIS.—G. Hilton and E. M. Crawford, Montreal.

A special card was evolved for recording the clinical, operative, pathological and radiological findings. The condition was graded, minimal, moderate, marked or maximal.

This study emphasized several things, among which the following were the most important: (1) The radiological examination must be precise. (2) Films of the best possible technical detail are necessary. (3) One must be pre-

pared to re-examine, in view of the individual difference in thickness of the bones of the skull. (4) Before operation is undertaken a re-examination of the sinuses is necessary if there is an interval of a few weeks since the original examination. (5) In most cases, if not in all, lipiodol is not necessary to determine the degree of thickening in the mucous membrane of the sinuses. (6) It is necessary to have films that can be compared, that is of the same technical quality.

The particular point is the use of the card for recording examinations.

WAR TIME RADIOLOGY.—J. Edmour Perron, Quebec.

Because of the confusion created among the different staffs of surgeons and radiologists of the army during the war of 1914-18 it would be advisable for all Canadian radiologists to practise the following: (1) The adoption of the metric system of measurement. (2) A foreign body can be localized without special extra accessories. (3) The use of fluoroscopy in routine cases. (4) The adoption of standard comparisons for determination of the volume of a foreign body, (a) metallic dust to a wheat seed, (b) a wheat seed to a pea, (c) a pea to a bean, and (d), when larger, the approximate diameter in centimetres. (5) Control of fluoroscopy by the radiologist during surgical intervention for the removal of a foreign body. (6) The adoption of a manual. Fortunately, we have such a book in French and English, entitled "Localization and Extraction of Projectiles" by a renowned surgeon, Professor Ombredanne and a well known radiologist, Ledoux-Lebard.

TREATMENT OF CARCINOMA OF THE TONGUE.—G. E. Richards, Toronto.

Dr. Richards discussed classification and suggested that it might be well to have an earlier stage than one in which the lesion is 3 cm. in diameter. He also outlined treatment by high voltage, with or without radium, and reported the following very satisfactory results. Out of 59 cases in Stage I 52 were under control while 7 were not. Thirty-five cases with enlarged secondary glands were controlled.

CALCIUM METABOLISM AND RADIOGRAPHY OF BONE.—J. Bouchard, A. R. Potvin and L. R. Payeur, Quebec.

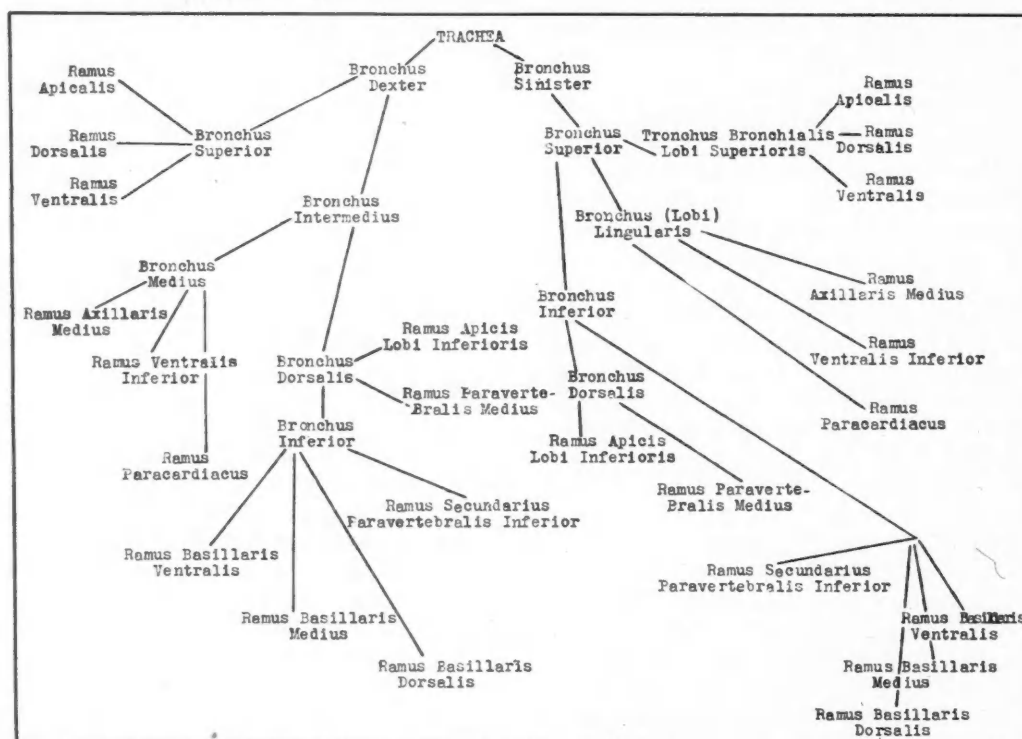
The writers reviewed the fundamentals of calcium metabolism before considering its local and general changes in bone. Systemic changes in calcium metabolism show in the whole skeleton and are related to excessive or deficient absorption, utilization and excretion. This is illustrated in rickets and its varieties osteomalacia, generalized osteitis fibrosa cystica, osteitis deformans, and the Marie-Strümpell disease.

Local calcium changes are related to altered vascularity, and the authors tried to demonstrate that radiographs of bone showing either osteoporosis, hypercalcification, or both, are readily understood by Leriche and Policard's theory. The latter hold that osteoporosis is the result of increased vascularity, while hypercalcification is due to decreased vascularity. Using a large number of radiographs, the writers demonstrated that, according to Leriche and Policard, increased vascularity explains osteoporosis which is secondary to traumatism (with or without fracture), local pressure, inflammation or disuse. Examples are, Krümmell's disease, osteochondritis of the tarsal scaphoid and femoral head and resorption of a bone graft. The findings in several other radiographs showing hypercalcification alone or in association with osteoporosis are as readily explained on the same principle.

The writings of Leriche and Policard on the physiology of bone were recommended to radiologists as an aid to a better understanding of bone radiography and to serve as an inspiration to further work in calcium metabolism.

currence of a left eparterial bronchus is so rare that "hyarterial" has little significance on that side. Also, the qualifying adjective "eparterial" is useless to designate the right superior lobe bronchus as this bronchus is nearly always "eparterial". Except for the origin of the right superior bronchus the distribution of the bronchi is three-directional. The normal position of the several pulmonary lobes in the antero-posterior axis produces a complex bronchial mosaic. The right anterior oblique projection affords the maximum visibility of the posterior right lung field, the left bronchial tree, and of the right postero-lateral and the left antero-lateral costophrenic angles. The left anterior oblique projection affords the maximum visibility of the left lung field and the right bronchial tree, also of the right antero-lateral and left postero-lateral costophrenic angle. The bronchographic study of one entire lung at one examination and of the contra-lateral lung at a second is preferable to the injection of a portion of either or both at one time.

The author included a graphic outline of the



THE ROENTGENOLOGICAL ANATOMY OF THE CHEST.—C. B. Pierce, Montreal.

For the diagnosis of the location of a given lesion and the prognosis and the management of treatment, all must have in mind a clear picture of the distribution of the bronchial tree and the associated vascular structures. The radiologist finds himself lost in bulky classical terminology. The retention of the qualifying adjective "main" or "major" in reference to the primary bronchi is superfluous and the oc-

new nomenclature based upon functional anatomy rather than upon comparative anatomy.

The New Brunswick Medical Society

The Executive Council of the New Brunswick Medical Society met in Saint John on April 16th. At this meeting there was a very full attendance. Accumulated routine business was handled, as well as a complete discussion of medical services as related to the present

national emergency. A full report was received from Dr. W. E. Grey concerning business transacted at the April meeting of the Executive Council of the Canadian Medical Association at Ottawa. A tentative program was arranged for the 60th annual meeting of the New Brunswick Medical Society, and progress was reported along this line. Dr. A. L. Gerow was confirmed as a representative of the New Brunswick Medical Society on the Board of Governors of the Victorian Order of Nurses of Canada. Dr. W. E. Grey was named to represent New Brunswick on the Executive Committee and the Nominating Committee of the Canadian Medical Association for 1940.

Regina and District Medical Society

The regular meeting of the Regina and District Medical Society was held on April 25th. The guest speaker of the evening was Dr. G. R. Walton, Regina City Health Officer, who spoke on "Some aspects of the control of communicable diseases". He outlined the work of Ramon with diphtheria toxoid, and told how the Connaught Laboratories had made enough of this toxoid to immunize 3,000,000 people. He described the complement fixation test for smallpox, and wished that the Saskatchewan Provincial Laboratory would do this work. The British Columbia Provincial Laboratory is the only public laboratory in Canada which does this test. Dr. Walton recommended the use of pertussis serum in the prevention of whooping-cough, emphasizing the fact that it must be kept in a refrigerator between doses. He described the use of convalescent serum for the prevention of measles in the Regina Children's Shelter this winter. The inoculation of Regina school children against scarlet fever appears to be giving results, but it is too soon to draw definite conclusions.

LILLIAN A. CHASE

The Saint John Medical Society

At the last regular monthly meeting of the Saint John Medical Society, Dr. H. A. Farris was the special speaker. Dr. Farris discussed the aid available to the physicians from the laboratories in the practice of medicine, including x-ray cardiographic examinations as well as the more commonly used laboratory methods. Practically every member present took some part in the discussion.

The Vancouver Medical Association

The following are the incoming officers and executive of the Vancouver Medical Association for 1940: *President*—Dr. D. F. Busteed; *Vice-president*—Dr. W. M. Paton; *Past-president*—Dr. A. M. Agnew; *Secretary*—Dr. M. McC. Baird; *Treasurer*—Dr. W. T. Lockhart; *Members of Executive*—Drs. Colin A. McDiarmid and L. W. MacNutt.

Post-Graduate Courses

Summer School Clinics

Vancouver Medical Association, June 25 to 28, 1940, inclusive, at Hotel Vancouver, Vancouver, B.C.

Speakers: Dr. Wm. S. Middleton, Dean and Professor of Medicine, University of Wisconsin, Medical School, Madison, Wisconsin; Dr. Frederick L. Reichert, Professor of Surgery, Stanford University, School of Medicine, San Francisco, California; Dr. P. C. Jeans, Professor of Paediatrics, University of Iowa, Iowa City, Iowa; Dr. William Magner, Department of Pathology, University of Toronto, Toronto, Canada; Dr. A. W. Farmer, Department of Surgery, University of Toronto, Toronto, Canada. Fee: \$7.50. Information: Dr. H. H. Caple, 203 Medical Dental Building, Vancouver, B.C.

University Notes

Dalhousie University

May 14th was Convocation Day at Dalhousie. President Carleton Stanley conferred the degrees of Doctor of Medicine and Master of Surgery on 35 of the 36 young men who took the conjoint examinations of the university and the Provincial Medical Board. For the second successive year the high standard necessary for the award of the University Medal was not attained.

The honorary degree of Doctor of Laws was conferred on Dr. Jemima MacKenzie, Dalhousie medical graduate of 1904. Dr. MacKenzie, native of Pictou, N.S., has spent many years of labour and achievement in India in medical missionary work. In 1918, she received the Kaiser-i-Hind Medal from the Governor of India, for outstanding service.

Introduced by Dr. Ralph Smith, provincial pathologist, seconded by Dr. N. H. Gosse, the following motion was passed unanimously and enthusiastically at the Medical Faculty meeting:

In view of the fact that the firm of Bausch and Lomb, of the United States of America, have a contract with Zeiss of Jena not to supply any optical instruments to the Allies for their war effort for the duration of the war, I move that we, as a Faculty, cease to trade with them, or buy their goods from their agents in Canada; and that this matter be brought to the attention of the Senate for further action in other Faculties, and in other universities throughout Canada.

Letters, Notes and Queries

Black Snow

To the Editor:

No doubt some have heard about "red snow". It has been described by scientists and found in

Answers to letters appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

cold northern regions, as due to microscopic algæ. But what about "black snow"? This sounds paradoxical, for we are accustomed to snow as pure and white. I will attempt to give a description of what I have seen, which I hope will lead to further investigation.

In December last I crossed the lake where I have my cabin, on snowshoes, the snow on the lake being crisp, pure and white undisturbed by any traffic by man or beast; the weather being sub-zero, dull, and cloudy. Before my return a slight snow had fallen and on the lake it seemed a little darker in hue. Retracing my footsteps, I found the imprints I had made decidedly black. The fresh snow, being fine, was drifting along in the slight wind. Stooping down to examine the cause of my dark imprints, I found the black substance blown into my tracks resembled fine soot, and the whole body seemed to move on being touched, and on pressing between the fingers it squashed and was sticky.

Was this an alga and could it be a relative of the fresh water algæ found in polar regions in pools of melted snow on the ice? Dr. Fridjof Nansen, the Norwegian explorer in his book, "Farthest North" mentions it but does not give any explanation from whence it appears.

I am of the opinion that this alga is brought in the fine snow, especially noticeable on a muggy cold day, but how it stands the sub-zero temperature and from whence it originates I have to learn.

Shortly after reaching my cabin my throat showed symptoms of soreness with irritation. I wanted to cough without getting relief. This later turned to a cold affecting the nose. I could give no reason for my complaint but that I had inhaled a good number of algæ into the delicate throat and nasal membrane.

My cure was simple. I gargled with hot water, also taking it up into the nostrils. The following morning I felt quite normal. I do not say what I have described is the only cause, but in my case I could see no other. I live alone, am not subject to colds, and do not come in contact with the civilized herd unless when visiting in a city.

The purpose of this communication has been merely to call attention to what so often passes our observation. I have talked the matter over with trappers and fishermen of the cold north and they have stated having noticed this black snow described. I hope that others who have seen and know something about "black snow", as I have designated it, will add more to our present knowledge of its genesis and occurrence.

H. F. BOYCE, M.D.

Big River, Sask.

Answer.—I can find no reference to "black snow" in the literature. It is likely that the phenomenon described is due, not to algæ, but to volcanic dust. Several volcanoes are somewhat active in Alaska just now. Only a microscopic examination could settle the question.—[Ed.].

Abstracts from Current Literature

Medicine

Diagnosis of Polycythæmia. Dameshek, W. and Heustell, H. H.: *Ann. Int. Med.*, 1940, 8: 1360.

The authors point out that the rarity of this disease may be more apparent than real, and discuss from a careful analysis of 20 cases the bewildering variety of early symptoms. They seek to find some common denominator in this respect as most cases before becoming full blown show a preponderance of symptoms referable to some one bodily system such as the cardiovascular, peripheral vascular, central nervous system, etc. Generally, the disease is of slow progression, simulating for months to years conditions such as migraine, neurasthenia, gastrointestinal disorders, menopause or others. The plethoric person may always be suspected; few laboratory data are needed to confirm the diagnosis. He may impress the examiner with the multiplicity of his symptoms, especially referable to the central nervous system, severe headaches of the migraine type, complaints pointing to vascular disease of the extremities, multiple thromboses, severe bleeding following slight operative procedures. The high facial colouring, reddish cyanosis, dilated retinal veins, enlargement of the spleen and liver, thick coated, fissured tongue are physical signs accompanying the disease at its height. However, as there is no other pathognomonic sign or symptom, it is to the blood examination that one must look for confirmation, particularly to get the early clue. The most significant factor is the elevation of the erythrocyte count which should be above 6 million per c.mm. and may be as high as 11.0 million. Together with this there will be an increase in the hæmoglobin content, certainly over 100 per cent and possibly 170 per cent; an increase in the leucocyte count and platelet estimation. The authors recommend for treatment the use of repeated venesection, the frequency of which may be controlled by blood examination and the administration of a diet with as low an iron concentration as possible.

T. STEWART PERRETT

Surgery

Infection as a Cause of Massive Hæmorrhage in Chronic Peptic Ulcer. Lisa, J. R. and Likely, D. S.: *Arch. Surg.*, 1940, 40: 15.

Massive hæmorrhage from chronic ulcer of the stomach or duodenum is one of the most serious accidents which can occur. In many instances the etiology is obscure. The demonstration of bacteria has been reported occasionally in cases of peptic ulcer in which death followed massive hæmorrhage.

The seasonal incidence of recurrence of symptoms and of hæmorrhage in ulcer is a well

recognized phenomenon, during the months of February and March especially.

The streptococcus was the most frequent micro-organism as a causative factor. From ante-mortem cultures of the blood Friedländer's bacillus and hæmolytic streptococci were isolated, and micro-organisms of corresponding character were demonstrated at the point of hæmorrhage.

The authors' report five instances of death from hæmorrhage due to infection in peptic ulcers. In each of the five cases the criteria of chronicity were answered, i.e., distortion of the architectural pattern of the wall, fibrosis of the base of the ulcer, and some degree of chronic inflammatory cellular reaction. G. E. LEARMONTH

Ununited Fractures of the Neck of the Femur Treated by the Aid of Bone Graft. Henderson, M. S.: *J. Bone & Joint Surg.*, 1940, 22: 97.

In the 26 years from July, 1913, to June, 1939, at the Mayo Clinic bone grafts have been used for the treatment of ununited fractures of the neck of the femur in 77 cases. There are two ways in which the bone graft can be inserted. (1) In articular osteosynthesis the joint is opened, the site of fracture examined, the fragments freshened and fitted, and the bone graft inserted. (2) In extra-articular osteosynthesis a small lateral incision is made, the fragments are placed in correct alignment, and the bone graft is inserted through a tunnel which has been drilled through the neck and into the head. The technique of these two methods is described in detail. Provided shortening and deformity are corrected before operation, the author believes that in a case in which good fibrous union exists, a sufficient portion of the neck remains, and the head is viable, extra-articular osteosynthesis is the method of choice. A massive autogenous bone graft is used, either a piece of bone from the tibia (22 cases) or a full segment of the fibula (55 cases). The mortality was 2.5 per cent; the two patients died from pulmonary embolism.

After operation a double plaster spica is applied. It is worn for three months. If the x-ray appearance is satisfactory the patient is allowed to be about on crutches after four months and to begin weight-bearing at six months. In two instances in which extra-articular osteosynthesis was employed additional metal fixation in the form of a lag screw was used. It is felt that this type of procedure will make practical the use of bone grafting for many elderly patients. The standard for an excellent result following bone grafting is much higher than that for other methods. Function must be practically perfect. Bony union does not always mean an excellent result; there should be good motion with little or no limitation, and ability to put on the shoe and stocking. The end-results of 67 of the operations are noted; 69 per cent resulted in

union; 28 per cent resulted in failure. It is interesting that in the first 6 years that bone grafting was attempted at the clinic the percentage of union was 33.3 as compared with 79 for the remaining 19 years. This emphasizes the importance of experience, resulting in improved technique and proper selection of cases. The method has been employed in treatment of about one in ten of the ununited fractures of the neck of the femur encountered.

G. E. LEARMONTH

A Few Observations on Fat Embolism. Kolmert, F.: *Acta Chirurg. Scand.*, 1939, 83: 263.

The principal clinical types are the pulmonary and cerebral, with symptoms of pulmonary involvement usually dominating. The majority of cases show no clinical signs. The usual picture is a latent period of a few hours to a few days, with apathy as the most marked symptom, although frequently unrest, delirium, cramps, trismus and opisthotonus (tetanus-like) may precede or replace the apathy. These may be accompanied by cyanosis and dyspnoea and often a cough with thin sometimes sanguineous sputum, fever, and petechiæ on the anterior surface of chest or neck. Intracranial hæmorrhage is a difficult differentiation; with fat embolism there are a free period, increased fever and pulse, and usually no localizing neurological changes. It has been stated that fat embolism is present in 5 per cent of fatal fracture cases and in 1 to 2 per cent of fatal bone operations. Jirka, 1936, found diffuse patchiness and cloudiness in the lung parenchyma within 20 minutes after the development of symptoms of fat embolism. These changes remained for 2 to 3 weeks. The author is in favour of early x-ray examinations in cases of fat embolism. In 2 of their 3 reported cases recovery took place with the use of the oxygen tent continued for 4 days. Cyanosis was immediately relieved but returned with stoppage of the oxygen prior to that time. Caffeine, coramine, morphine and sympatol decreased the blood fat for 3 hour periods. Rappert has used decholin and eupaverin with as yet inconclusive results.

FRANK DORRANCE

Obstetrics and Gynæcology

The Clinical Significance of Pelvic Variations.

Thoms, H., Foote, W. R. and Friedman, I.: *Am. J. Obst. & Gyn.*, 1939, 38: 634.

A knowledge of pelvic variations and of the changes that may affect the conformation of the pelvis as a whole or in part is essential for the practice of scientific obstetrics. In order to recognize such changes a knowledge of the diameters and contours of certain pelvic planes is necessary. These planes are the plane of the pelvic inlet, the midpelvic plane, and the planes of the pelvic outlet.

A dimensional study of the pelvis for obstetrical purposes is possible only by roentgen pelvi-

metry, and simple and inexpensive methods for its performance are briefly outlined. The results of a pelvimetric survey in 200 white women are presented and from the mean diameters a criterion for "small" pelvis may be established. An analysis of operative intervention and of prolonged labour in this series shows that abnormal changes in the pelvis must be reckoned as among the important etiological factors.

ROSS MITCHELL

The Effect of Carcinoma of the Cervix Uteri and its Treatment upon the Urinary Tract. Everett, H. S.: *Am. J. Obst. & Gyn.*, 1939, 38: 889.

In patients with carcinoma of the cervix the presence of lesions of the upper urinary tracts before treatment is of grave prognostic significance. Approximately 50 per cent of apparently cured patients who have been treated for carcinoma of the cervix by irradiation show evidence that the urinary bladder has been affected by the treatment, but only about 20 per cent show effects that are of any serious significance. Approximately 50 per cent of patients so treated give evidence of some obstructive lesions involving the lower ureters with resulting dilatation of the kidney pelves and the ureters above the point of obstruction, but again in only about 15 per cent are these lesions sufficiently severe to be of clinical importance. The incidence of 15 to 20 per cent of serious urinary tract lesions in patients cured of carcinoma of the cervix is sufficiently high to render routine urological study of such patients a justifiable and important part of the follow-up procedure.

ROSS MITCHELL

Further Investigations on the Induction of Uterine Hæmorrhage by means of Progesterone. Second report. Zondek, B. and Rozin, S.: *J. Obst. & Gyn. of the Brit. Emp.*, 1939, 46: 736.

Progesterone, if administered during the post-menstrual stage, induces intermenstrual hæmorrhages in the normally menstruating woman (intracyclic hæmorrhage).

Progesterone is not effective if given in the intermenstrual stage, i.e., during, or subsequent to the rupture of the follicle, at a time, therefore, when the woman is already under the influence of the endogeneously produced corpus luteum hormone. The intracyclic hæmorrhage, therefore, does not occur if there is not an interval between the exogenous administration and the endogeneous production of the corpus luteum hormone.

The œstrone level which is physiologically present during the intermenstrual stage does not prevent the intracyclic hæmorrhage; if, however, additional amounts of œstrogenic hormone are given the inhibitory action becomes effective. The œstrogenic hormone interferes with

the hæmorrhage-producing effect of the corpus luteum hormone, as well as with the gonadotropic mechanism of the anterior pituitary.

P. J. KEARNS

Pædiatrics

Stomatitis in Childhood. Parsons, C. G.: *Arch. Dis. in Child.*, 1940, 15: 43.

In a study of 115 cases the author describes 5 types of stomatitis as of frequent occurrence in infancy and childhood. Pure thrush is most common in infancy. Aphthous stomatitis is characterized by small vesicles and shallow greyish ulcers. A combination of these two is the commonest form under the age of two years. Vincent's type of infection is seen in its pure form in older children, and in younger children it is commonly combined with the aphthous type. Neither the nutrition of the child nor the social grade from which it came appears to affect the incidence of the disease. Practically all affected children were either bottle-fed or used a dummy. Gastro-enteritis is the complication to be feared in infancy. The blood count averaged 14,000, and a persistent monocytosis of from 5 to 10 per cent was noticed, regardless of the type of infection.

An attempt was made to assess the relative merits of different forms of treatment. An impression was gained that the disease was not, as generally supposed, a self-limited condition, as a control group treated with saline mouth washes failed to improve until other treatment was instituted. As there was no evidence to support the belief that the stomatitis was due to dietetic or vitamin deficiency, only local treatment was employed. Four different applications were tried, viz.: (1) 1 per cent aqueous gentian violet; (2) novarsenobillon 0.6 g. dissolved in 6 c.c. glycerine and 12 c.c. water; (3) 10 per cent aqueous solution of sodium perborate; (4) tincture of mentholate (Lilly).

The average duration of treatment before cure was 6.7 days for gentian violet and mentholate, 7 days for novarsenobillon, and 10 days for perborate. Glycerine and honey and borax seemed to be about as ineffective as saline. Symptomatic relief was particularly rapid with 1 per cent gentian violet, and this is the cheapest form of treatment.

REGINALD A. WILSON

The Nature of Hæmorrhagic Disease of the Newborn. Quick, A. and Grossman, A.: *Am. J. Med. Sc.*, 1940, 199: 1.

Hæmorrhagic disease of the newborn has for a long time been noteworthy as a disease in which there was a specific treatment but an unknown etiology. With the recognition of prothrombin deficiency as a cause of hæmorrhage and the discovery of the rôle of vitamin K in its synthesis came a new approach to the study of this problem. The authors show that at birth the infant's prothrombin level is high, but it

drops precipitously during the first days of life and then is spontaneously restored. Since subjects of hæmorrhagic disease fail to regenerate their prothrombin to normal levels, they consider that its fundamental cause is a deficiency of vitamin K whose presence is known to be necessary for the natural restoration of the prothrombin to normal levels. This fact is further substantiated by the observation that the prothrombin level can be restored promptly to normal by administration of this vitamin.

The authors then speculate as regards the mechanism of the vitamin K deficiency and its normal restoration. They offer the interesting hypothesis that as vitamin K may be of bacterial origin its availability in the human infant is dependent upon bacterial action in the gut. This would explain the finding that hæmorrhagic disease is more common in hospital practice than in the out-patient service where the infants have a better chance to infect their own gastrointestinal tracts. On these grounds suggestions are made concerning prevention and treatment of the disease. Prevention of the fall in the clotting factor can be prevented by the oral administration of 1 c.c. of vitamin K in oil. In the normal infant this hardly seems necessary, and the authors suggest that perhaps a return to the practice of early breast-feeding will suffice.

REGINALD A. WILSON

Oto-rhino-laryngology

The Treatment of Dysphonia and Allied Conditions. Macmahon, C.: *J. Laryngol. & Otol.*, 1939, 54: 343.

Dysphonia occurs after some operations on the throat and larynx, and may also be due to inflammation of the vocal chords resulting from infected teeth, tonsils and sinuses. Other cases result from certain heart diseases, neurasthenia, and gross misuse of the voice, etc. A short vocal treatment following medical attention will often effect a cure in these cases. Correct breathing movements, and especially nasal breathing, are necessary to assure a good voice. A healthy nose is particularly essential. Dysphonia following operations on the thyroid is especially severe and may be associated with difficulty in breathing and stridor.

The first thing in voice treatment is to try to acquire gentle lower costal breathing, to avoid upper costal breathing, and to try to produce a deeper pitch. The latter may be accomplished by driving the back of the tongue downward a hundred times night and morning, on the sound of "ah". This is further facilitated by trying to keep the larynx down in the neck when speaking.

Roughness of the voice often follows operations for intrinsic carcinoma of the larynx. The

treatment is the same as outlined above, but the pitch need not be so low. After removal of papillomata from the chords, voice training is beneficial. Functional aphonia is allied to dysphonia, and can often be cured by the above-described depression of the tongue. Spastic dysphonia in highly strung persons is due to over-work and over-anxiety. Even this can be cured by breathing exercises. The high-pitched or falsetto male voice may also be cured with a few exercises.

After laryngectomy training the voice should be attempted very soon, even if healing is not complete. The patient is taught to swallow air by advancing the abdominal muscles. The patient develops a pharyngeal voice and speaks as it were on the top of a belch. If this cannot be acquired the artificial larynx should be used.

E. A. STUART

Orthopædics

An Analysis of Twenty-eight Consecutive Cases of Incapacitating Shoulder Lesions, Radically Explored and Repaired. Bosworth, D. M.: *J. Bone & Joint Surg.*, 1940, 22: 369.

This paper may be regarded as an extension of Dr. Codman's work on shoulder lesions. It deals with a series of the most severe types of painful shoulders.

The author divides his cases into three main groups: (1) tendon lesions; (2) bursal lesions; (3) exostoses of the greater tuberosity. Four cases of complete detachment of the short-rotator cuff are discussed. All were associated with dislocation of the shoulder and were of the type with unstable reduction. In at least two of the cases the detachment was probably caused by energetic efforts at reduction and were associated with axillary nerve palsy. The clinical results were failures except in the one case where fusion of the joint was carried out. This the author advises as the correct treatment in the majority of cases of this type.

Three cases of complete rupture of the supraspinatus and infraspinatus tendons are described. The cases were operated on within six weeks of the accident. All showed a degeneration of the tendon substance and of all parts of the joint structures. Improvement followed operative repair.

The exostoses of the greater tuberosity are of more interest than the bursal lesions. One case of sharp and one of rounded exostoses are discussed. The author describes the operative approach and repair he considers best in which the deltopectoral interval with cross section of the clavicular fibres of the deltoid is used. He chisels away the greater tuberosity and sutures the cuff back to the bare area of bone so produced with sutures through drill holes in the bone.

H. F. MOSELEY

Radiology and Physiotherapy

Chronic Gastric Volvulus. Singleton, A. C.: *Radiology*, 1940, **34**: 53.

The radiological findings in chronic gastric volvulus are so characteristic that they are not likely to be confused with any other lesion. One usually obtains a clue from seeing the high transverse gas bubble under the dome of the diaphragm on both sides of the midline, and the barium meal confirms the suspicion that volvulus of the stomach is present. In the differential diagnosis of total chronic idiopathic gastric volvulus, one must exclude simple high position of the stomach in hypersthenic patients and those cases in which the stomach at first seems high but later assumes its normal position when the full meal is given. One should do a colon examination in all suspected cases, to exclude simple displacement of the stomach by a distended colon or to show the presence of an associated or intermittent hepato-diaphragmatic interposition.

Gastric volvulus may be present without producing symptoms, or it may produce recurring attacks of mild or fairly acute upper abdominal distress. It may be present without cardiac or pyloric obstruction or strangulation of blood supply and may undergo spontaneous resolution.

The probable etiological factor in total volvulus is an abnormally long gastrohepatic or gastrocolic omentum, or both of these, probably of congenital origin. The author presents three cases.

R. C. BURR

Correlation of Post-mortem Chest Teleroentgenograms with Autopsy Findings. Hampton, A. O. and Castleman, B.: *Am. J. of Roentgenol. & Radium Therapy*, 1940, **43**: 305.

Roentgenological examination of the lungs after death is a definite aid in the pathological examination.

A description is given of a routine method of taking post-mortem teleroentgenograms and of preparing the lungs by a formalin injection-inflation technique in order to permit an accurate correlation between the anatomical lesions in the lung with those demonstrated on the roentgenogram.

From a study of over 3,500 autopsies the apparently increased frequency of pulmonary embolism and infarction is emphasized, and special note is made of the higher proportion among medical rather than surgical patients. The size, shape, usual locations, and the peripheral nature of infarcts are described. Infarcts of the lung are always in contact with pleural surfaces, and the long axis of the infarct is parallel to the longest pleural surface it involves. The cardiac margin of the infarct is convex or "hump" shaped.

The term "incomplete infarction" is suggested for the syndrome characterized by pleural

pain or blood spitting, or both, associated with a rapidly appearing and disappearing infarct-like area of consolidation in the lung without alveolar wall destruction. This is shown to be similar to the oft-repeated experimentally produced lesions which had been previously ignored as regards clinical application.

Although the correlation of the clinical findings of the cases in this study has not been fully completed, it is apparent that: (a) There is often insufficient clinical evidence of pulmonary infarction to allow a diagnosis; for example, there may be no pleural pain, blood-spitting or any obvious source of an embolus, but, given any one of these findings together with roentgenological evidence consistent with an infarct the diagnosis may be made. (b) In view of the fact that one-third of the cases of pulmonary infarction occur in patients who have not been operated upon and who have no demonstrable cardiac disease, it is important to consider pulmonary infarction in the differential diagnosis of pulmonary disease in ambulatory patients.

R. C. BURR

Therapeutics

The Neurocirculatory Clinic; A Summary of its Activities. I. Peripheral Vascular Disease. de Takats, G., Beck, W. C. and Roth, E. A.: *Ann. Int. Med.*, 1939, **6**: 957.

The value of an adequately staffed clinic for the study and treatment of the many ramifications of peripheral vascular diseases is stressed in this report from the University of Illinois. The subject material, omitting arterial thrombosis and congenital anomalies, consists of Buerger's and Raynaud's diseases, and obliterating and diabetic arteriosclerosis. A simple working classification is given according to the various stages of these diseases, and having regard to oscillometric index, onset of claudication, presence or absence of pain. This is of value in determining the combination of therapeutic agents to use in any one condition, as this is, indeed, the problem in treatment. In this clinic an exceedingly thorough general physical examination is given, with particular attention to the blood, kidneys, heart, x-ray, etc., by special departments wherever indicated. Each patient is presented with a printed sheet on which are detailed instructions for the care of the feet.

The various forms of treatment are now discussed. With regard to physical therapy, heat, in the form of a simple electric baker or diathermy where possible, and postural exercises are widely used. Contrast baths are never used and massage only sparingly. Under drug treatment, mecholyl is the only vasodilator recommended, and then only for softening the induration of scleroderma; little benefit seemed to result from such agents as nitrites, papaverine or padutin. In the arteriosclerotic group one

of the theobromine group seemed of value. In the acute inflammatory stage of Buerger's disease or of migrating phlebitis, graded doses of T.A.B. vaccine were useful, whereas the use of sodium chloride intravenous solutions gave only a transient reaction.

Of special value was treatment by passive vascular exercise, the Pavaex machine being most suitable. However, in an attempt to substitute this with a simple and inexpensive method, intermittent venous hyperæmia with an inflatable 8-inch cuff was used with considerable benefit. The success of surgical treatment is measured by the care with which patients are chosen for this procedure. Sympathectomy in these well-chosen cases is attended with marked success. For some cases of Buerger's disease, unsuitable for sympathectomy, paravertebral nerve block with alcohol was used with benefit, but the crushing of the sensory nerves to the foot is to be deprecated. Amputation is resorted to only when the member is hopelessly lost. In conclusion, it is the careful evaluation of the patient and his disease which makes possible the choice of the correct combination of therapeutic agents necessary for the greatest benefit in treatment.

STEWART PERRETT

Autonomic Therapy in the Psycho-neuroses.

MacMillan, D. and Fischgold, H.: *J. Mental Sc.*, 1939, 85: 1036.

Most drugs used in pharmaco-dynamic tests are amphotropic (acting on both divisions), usually with one action predominating. And there may be an atypical reaction, *e.g.*, a sympathetico-trope drug may produce a parasympathetic response.

The reaction of an organ is determined and modified by its "internal milieu", *i.e.*, the existing concentration of ions and internal secretions within the cell and the surrounding fluids. The state of the autonomic system cannot therefore be described by a simple scheme such as the balancing of a scale. A more complicated formula is necessary. In the treatment of psychoneurotics a complete "autonomic formula" is not necessary in all cases. The leading symptoms and main complaints give enough insight into the underlying autonomic disturbance which can in many cases be removed by sympathetotropic or parasympathetotropic drugs.

Although severe or deep-seated psychoneurotic disturbance cannot be cured by drugs, suffering can be relieved and further psychological treatment helped along, and a vicious circle is broken, *i.e.*, the focussing of the patient's attention on a symptom possibly secondary in nature which becomes starting point of further psychological upset.

Although the well-known relationship between anxiety neurosis (the condition found in the majority of cases studied) and sympathetic overaction was obvious, the author warns against

the temptation to correlate the various psychological states with certain autonomic types.

To combat overaction of the autonomic system, the most common type of upset, depressants, principally luminal in half-grain doses, ergotamine, and belladonna were found effective. The treatment had to be continued for long periods. In the smaller number of cases in which autonomic stimulants were called for benzedrine and ephedrine or the choline preparations were given according to the division of the autonomic system showing signs of underaction.

A. G. MORPHY

Pathology and Experimental Medicine

Studies of Cerebrospinal Fluid in Cases of Injury to Head. Gurdjian, E. J., Webster, J. and Sprunk, C. J.: *Arch. Neur. & Psychiat.*, 1939, 42: 92.

The authors have studied thoroughly the immediate effects on cerebrospinal fluid of varied procedures. The lumbar puncture needle was kept in place for two hours and occasionally longer. In some instances late effects have been studied by repeated punctures. Investigations of this type require particularly careful supervision as the possibilities of error are manifold. Psychic influences, muscle movements, the customary physiological variations, cerebrospinal fluid leak, effects of anæsthesia, etc., are but a few of the manifold sources of confusion which must be avoided.

The lumbar puncture was performed with the patient in the lateral position, the needle connected with an Ayer manometer held in a clamp. A base line of pressure was established for fifteen or more minutes. The number of patients studied seems quite adequate, and the carefully selected control groups render all conclusions impressive to a degree.

The sudden drop of cerebrospinal fluid pressure caused by lumbar puncture was followed by a slow secondary rise reaching the initial level in approximately 50 per cent of cases. In a certain number the secondary level was 20 to 60 mm. above the original level, but in no case were alarmingly high pressures reached. Lumbar puncture as a decompressive agent in cases of head injury is considered to be worth while.

Intravenous isotonic solutions did not raise the intracranial pressure. Nor were the delayed effects remarkable in any way. The not uncommon practice of restricting fluids in head injuries is severely criticized. Hydration produces no rise in cerebrospinal fluid pressure and the dangers of dehydration are known beyond dispute. The patient must be held in adequate fluid balance.

Morphine produces a sharp rise in cerebrospinal fluid pressure in all cases of head injury, though it has little effect on controls. This,

combined with the better known dangers of masking signs and the depression of respiration would almost interdict the use of opium in any form; indeed all sedatives must be used with extreme caution.

Intravenous sodium luminal produced practically no effect.

G. N. PATERSON-SMYTH

Hygiene and Public Health

The Prevention of Silicosis: Experimental Investigations on the Action of Certain Non-siliceous Dusts and Silica in the Origin and Development of Silicosis. Naeslund, C.: *J. Indust. Hyg. & Tox.*, 1940, 22: 1.

The author begins his paper with a comprehensive review of the literature.

His experimental work deals with three types of dusts: (1) inert dusts which would not react to silica but might have an effect on the tissues in diminishing tissue reaction to silica; (2) dusts which might increase the solubility of silica (NaOH, etc.); (3) dusts which might decrease solubility. These dusts would be largely positively-charged dusts, silica carrying a negative charge.

Experiments were carried out by subcutaneous and intraperitoneal inoculation, by intratracheal insufflation, and by inhalation. The first two routes were used for preliminary testing in order to gain an idea in advance of the tissue reaction to mixed dusts. The intratracheal insufflation and inhalation routes were those used to determine the pulmonary effects. The results, using these two methods, were practically identical. Quartz dust was used as a source of silica, and the other dusts were added usually in the ratio of 4 of quartz to 1 of the other dusts. The experimental animals were guinea pigs and rabbits.

Under the experimental conditions, using a very high concentration of dust (500,000 to 5,000,000 particles per cubic centimetre), a considerable number of animals died quickly. Of those who survived, animals exposed to quartz dust only developed extensive silicosis in less than a year. Coal, mixed with quartz, appeared to have no appreciable inhibiting effect on the development of silicosis. Irritating dusts, like NaOH and Ca(OH)₂, did not appear to accelerate the development of silicosis. The animals, however, manifested great susceptibility to pulmonary infection. The experiments with quartz and metallic aluminum or aluminum hydroxide indicated that these substances considerably retarded the rise of silicosis, and at length had an inhibitive effect upon the development of fibrotic reactions in silicosis. Complete protection against proliferative fibrosis due to silicosis was not obtained. Iron and magnesium dust also proved to possess a certain, if slight, inhibitory effect upon silica. Cement dust brought about a certain abatement of the effect of quartz,

although it appeared to increase the risk of pulmonary infection?

The author suggests that certain atypical cases of silicosis in human beings might be explained by the interaction of the siliceous dust with other dusts, and warns against the premature application of experimental results to human beings.

FRANK G. PEDLEY

Obituaries

Dr. John Henry Bell, of Hamilton, Ont., died on May 8, 1940.

Dr. Bell was born in Kingston, Ont., in 1867, and was educated in Kingston public and high schools, the Ottawa Normal School and Queen's University, later attending Trinity School of Medicine, Toronto (M.D., Trinity and Queen's, 1890). A specialist in chest ailments, he was superintendent of Queen Alexandra Sanatorium, London during the Great War. He was active in municipal affairs there before coming to Hamilton. In 1926 he was elected to the Hamilton Council as Alderman and the following year became a member of the Board of Control, serving four years. He was defeated in 1932 when he aspired to the mayoralty.

Dr. John Douglas Berry, of Willowdale, Ont., died on May 1, 1940, in his seventy-eighth year. A native of Millbrook, Ont., he was educated at Cobourg, taught school in Hastings for three years, and then entered Trinity Medical School, Toronto, where he took his degree (1890). Returning to Hastings he opened a practice there in 1906. After three years' practice in Cuba as a company doctor he returned to Port Perry, later moving to Willowdale.

Dr. George Henry Bowles, of Toronto, died on April 10, 1940, in his seventy-seventh year.

Born at Sand Hill, Peel County, Dr. Bowles received his early education at Brampton High School and Ottawa Normal School, and graduated from the Toronto Medical College in 1892. Before entering his medical course he taught school for several years at Meadowvale. Following post-graduate study in England, he opened a practice jointly with the late Dr. Herbert Hamilton in Wood Hill. Coming to Toronto in 1907 he established a practice which he continued until his retirement in 1937 because of ill health.

Dr. Robert Edgar Buswell, of Calgary, died suddenly on April 15, 1940, in his sixtieth year. He was born at Exeter, Ont., on May 17, 1880, and was educated at St. Mary's Collegiate Institute. He came west to High River in 1902 and taught school there until 1904 when he entered the University of Toronto to study medicine. He graduated in 1908 as silver medalist of his year. Following an internship in a New York hospital he returned to High River to practise, where he remained until 1929, when he left for Europe to spend three and a half years in post-graduate studies in London, Vienna and Budapest, in diseases of the eye, ear, nose and throat. He returned to Calgary in 1933 where he practised his specialty until the time of his death.

Dr. Donald St. Clair Campbell, Public Health Officer at LaPlata, Maryland, died unexpectedly in hospital at Washington, D.C., May 7, 1940. Dr. Campbell was a native of Halifax, N.S. He was 47 years of age.

Dr. Campbell graduated from Dalhousie in 1916, and served overseas in the first world war, being wounded at the second battle of Amiens. Returning from France, he practised in Halifax before moving to the United States where he became attached to the Public Health Service. He received his D.P.H. degree at Johns Hopkins, and served in Virginia and Maryland.

Dr. Alfred Hans Waring Caulfeild, of Toronto, died on May 2, 1940, in his sixtieth year.

Dr. Caulfeild was born in Vienna, Ont., November 27, 1879, son of Hans James Caulfeild, in direct line to the last Earl of Charlemont, and Jane Brasher. He was educated at the Toronto Model School and Upper Canada College. He graduated in medicine from the University of Toronto in 1904.

Dr. Caulfeild served in the Great War in England and France with the Canadian Army Medical Corps.

Dr. Caulfeild was one of the foremost pathologists in Canada and the United States. He was a past president of both American societies of allergy, the American Association of Allergy and the American Association for the Study of Asthma. He was associated with the Department of Pensions and National Health and was on the staffs of Christie Street Hospital, Toronto General Hospital and Toronto Western Hospital. Also he was a research member of the Connaught Laboratories, University of Toronto. He was director of the pathology department of the Muskoka Cottage Hospital and Muskoka Free Hospital for Consumptives.

He was the author of many articles and books on medical subjects.

Dr. Louis Philippe Dorval, of Montreal, died on April 24, 1940. He was born at Joliette, Que., in 1880, and educated at L'Assomption College and the University of Montreal (M.D., 1903). He was secretary of the Federation of Medical Societies of the Province of Quebec.

Dr. Hugh N. MacDonald died at his home in Whyecocomagh, N.S., on May 8, 1940. He was 83 years of age. Dr. MacDonald graduated from Queen's University in 1882, and had been practising in Whyecocomagh for the past 48 years.

A famous athlete of years ago, conqueror of the American wrestling champion Lynch, and of John L. Sullivan at his height, in a battle outside the ring; faithful servant of his Cape Breton patients through more than half a century, Dr. "Hudy"'s death removes a colourful, beloved figure.

Dr. William Wallace McKinley, of Toronto, died on April 14, 1940, aged sixty-six. Born at Seeley's Bay, Leeds County, Dr. McKinley was a graduate of the Ontario Agricultural College, Guelph, and later graduated in medicine from Queen's University (1903). He spent some time in Edinburgh and Glasgow in post-graduate study.

For nineteen years he was prominent as a physician and surgeon in Port Hope, and took an active interest in municipal affairs. He was largely responsible for the building and development of the Port Hope Hospital, and was a past chairman of the Port Hope School Board. He removed to Toronto in 1925.

Dr. Cecile Markowitz, of Toronto, wife of Dr. Jacob Markowitz, died on May 14, 1940. She was a native of Toronto, graduated from the University of Toronto in household science and served a year as dietician at the Military Hospital in Kingston, Ont. For several years she carried on research work in bacteriology in the Connaught Laboratories and received her degree of Doctor of Medicine from the

University of Toronto in 1929. Later she served with her husband on the research staff of the Mayo Clinic at Rochester, Minn., and following two years in Washington, returned to Toronto and engaged in private practice. She was on the staff of the Women's College Hospital in that city and a member of the Child Welfare Board.

Dr. Ethelbert Reavley, of Spirit River, Alta., died on April 28, 1940, at the age of 79. He graduated from McGill University in 1887, and the following year registered in Ontario. The call of the West came to him and he registered with the College of Physicians and Surgeons of the North-West Territories in 1905 and opened an office in Rosthern. After some years in what is now Saskatchewan, he moved to Steeveville, Alta., later to Bowden, and then to the Peace River district. Ever a pioneer, he continued as such to the end. The profession knew him as a self-effacing, painstaking, conscientious general practitioner. He was one of nature's gentlemen, and his record of service to the indigent needy would be an inspiration to all.

Dr. Hugh Horace Ross, who had practised in Seaforth for more than forty years, died on April 8, 1940, after an illness of some weeks, in his seventy-third year. He was born near Brucefield, the son of the late John Ross, one of the original pioneers of Stanley Township, who took up his land from the Crown, when this district was known only as the Huron Tract, and received his elementary training at the Seaforth High School. On graduating from the Medical Faculty of Toronto University (1896), he began to practise in Auburn. Two years later he spent some time in post-graduate work in England, followed by a short course in ophthalmology in Chicago. He then returned to Seaforth. Throughout his long life he constantly identified himself with community work, of which many evidences will long remain. He formed a close alliance with the other doctors of the town in medical co-operation, at a time when such things were rare in Ontario, and in Seaforth the term "opposition" as applied to a fellow practitioner, became "colleague". This had a great deal to do with the high type of medical service in that neighbourhood.

Dr. Frank Andrew Smith, of Winnipeg, died on April 11, 1940, aged 57. For three years he had been in poor health. Born at Whitemouth, Man., he was educated in Winnipeg schools, St. John's College, and Manitoba Medical College from which he graduated in 1906. He practised at Maple Creek, Sask., and Birtle, Man., where he opened a private hospital, which later became the municipal hospital, and Winnipeg. Before beginning work in Winnipeg, he took special training in x-ray at Chicago and in radium at New York.

He was a member of the staff of the Winnipeg General Hospital for some years and a member of the faculty of Manitoba Medical College. At the time of his death he was a staff member of the Children's Hospital, the Municipal Hospitals, the St. Joseph's Hospital, and the Mount Carmel Clinic. For four years he was a member of the Winnipeg School Board. One of his hobbies was the keeping of bees, and he was a past-president of the Manitoba Beekeepers' Association. Dr. Smith was one of the pioneers in radium therapy in Winnipeg. Affable in disposition, he had many friends both within and without the medical profession.

Dr. Alfred Thompson, of Vancouver, B.C., a former member of the House of Commons, died on April 20, 1940.

Dr. Thompson was born in Hants County, N.S., in 1869, and was a graduate of Dalhousie University (1898).

News Items

Alberta

The following is the program of the District Associations: The post-graduate speakers of the district associations of the Canadian Medical Association, Alberta Division, will be Dr. Irving Bell, internist, and Dr. R. G. Huckell, orthopaedic surgeon, both of Edmonton. In addition, Dr. F. T. Campbell, Calgary, president-elect of the Provincial Association and Dr. G. R. Johnson, secretary, will discuss medical organization and matters pertaining to present-day problems of our profession in Alberta.

In addition to the professors of the University of Alberta on the program of the refresher course at Edmonton, May 13 to 17, 1940, inclusive, the following will give addresses: Drs. P. H. T. Thorlakson, of Winnipeg; and Willis Merritt, of Calgary.

Dr. J. C. Bennett, of Peace River, has moved to Tacoma, Wash., where he has joined the Bridge Clinic and will restrict his work to obstetrics and diseases of children.

Dr. Percy J. Losier, of Chatham, N.B., has joined the Baker Clinic, Edmonton.

In the recent elections, provincial and federal, many physicians were nominated, but all were not successful. The successful ones in the Province were: Dr. P. M. Campbell, Lethbridge; Dr. L. J. O'Brien, Grande Prairie; Hon. Dr. Cross, Hanna, Minister of Health; Dr. J. L. McPherson, Ryley; and in the Federal election: Dr. F. W. Gershaw, Medicine Hat. G. E. LEARMONTH

British Columbia

Among the items furnished last month, we have to record an error with regard to the Annual Meeting of the Vancouver Medical Association. This was intended to have been a dinner meeting, but at the last minute the plans were altered, in view of the fact that two other major "Dinners" had been held during the month, and it was decided to revert to the usual style of evening meeting. Compensation in full, however, was afforded by the fact that Prof. F. H. Soward, of the Department of History of the University of British Columbia, was guest speaker, and gave a most illuminating address on "The Historical Background of the Present World War". Dr. Soward is an ideal historian, dispassionate and objective, and he reviewed without bias and without distortion the events of the past decade, and so showed us clearly the inevitability and naturalness of development of the present crisis—which is a struggle between ideologies rather than between nations.

There was a record attendance, and Professor Soward's contribution was highly appreciated.

Considerable interest is being shown by the public in the newly formed "Medical Services Association". This is now incorporated, and is beginning its work by signing up firms and groups of employees. A considerable number have already signed up, and as soon as a certain minimum is reached operations will begin. This scheme has the endorsement and support of the British Columbia Medical Association.

The Pentticton Hospital has just installed additional x-ray equipment and a new metabolism machine. All the doctors require now is a new hospital building.

The Eye, Ear, Nose and Throat Section of the British Columbia Medical Association held its Annual Meeting and Dinner in the Hotel Vancouver on March 30th. Dr. Meyer Wiener, Clinical Professor of Ophthalmology, Washington University, St. Louis, was the guest speaker, his subject being "Some of the newer methods

and treatments of glaucoma". This is being published in the *Bulletin* in the near future.

We revert for a few lines to the dinner tendered last month to Dr. Robert E. McKechnie, of Vancouver, on April 25th at the Hotel Vancouver, of which a very brief account was given in the May number of this *Journal*.

The attendance was the largest we have ever seen at a medical dinner, and the wide representation not only from the medical profession but from other departments of public life, was proof, if proof were needed, of the imprint this man has left on his time. The University of British Columbia, of which he is Chancellor, sent many representatives, among them Dean D. A. Buchanan, of the Faculty of Arts and Science. The Vancouver General Hospital also was largely represented. The D.M.O. of Military Headquarters No. 11, Lt.-Col. A. L. Jones, O.B.E., M.C., was present, and every part of the Province sent its quota. Many men from Seattle, Portland, and other points in the U.S.A. came. Telegrams of congratulation were read from the Principals of McGill and Toronto, from many of the staffs of these Universities, and from all over the country, from Halifax to Victoria, came a long list of congratulatory messages.

Dr. P. A. McLennan of Vancouver gave the toast to Dr. McKechnie, and the latter, at the end of a long evening of speeches and toasts, rose and gave a delightful little speech of his own, modest, and unassuming, and expressing great delight in the honour we all so gladly paid him. J. H. MACDERMOT

Manitoba

The two-year period allotted for the pregnancy survey in Manitoba expired at midnight, April 30th. It is expected that when all the returns are in some 20,000 reports will be available for study. The reports are now being coded and it is expected that a preliminary report will be presented at the annual meeting of the Manitoba Branch of the Canadian Medical Association in September. The information to be taken from the records for presentation at the meeting will include the following: Registration area, age of patient, racial origin of mother's father, social and marital status, previous health, previous pregnancies, prenatal care, symptoms of toxæmia, complaints (during prenatal period), hæmoglobin and, if anæmic, physical examination, foci of infection, pelvic measurements, month of delivery, place of delivery, attendant at delivery, kind of labour, anæsthetic, sex of fetus, weight of fetus, single and plural births, breast fed or not. The afternoon of the day on which this report is to be presented will be devoted to obstetrics, with special emphasis on such subjects as post-partum hæmorrhage, the diagnosis of the toxæmias, and the treatment of the ante-partum hæmorrhage.

On May 1st an organization meeting was held of the Medical Advisory Committee of the Sanatorium Board of Manitoba. The following were present: Dr. E. W. Montgomery, Department of Health; Dr. Ross Mitchell, Professor of Obstetrics; Dr. J. C. McMillan, Radiologist, Winnipeg General Hospital; Dr. J. D. Adamson, Professor of Medicine; Dr. B. H. Olson; Dr. F. W. Jackson, Deputy Minister of Health; Dr. D. McIntyre, Superintendent, King Edward Sanatorium; Dr. A. C. Sinclair, Superintendent, St. Boniface Sanatorium; Dr. Morley Loughheed, Winnipeg Medical Health Officer; Dr. D. L. Scott, Superintendent, Central Tuberculosis Clinic; Dr. E. L. Ross, Superintendent, Manitoba Sanatorium; Dr. Maxwell Bowman; Lt.-Col. J. Y. Reid, Secretary of the Board. Dr. J. C. McMillan was appointed chairman and Lt.-Col. J. Y. Reid, Secretary of the Committee. It was decided to hold meetings every three months before the meeting of the whole Board and to undertake investigation into the value of surgery in pulmonary tuberculosis, the problem of the infected patient who refuses to go to a sanatorium, and the relationship of pregnancy to

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pulmonary tuberculosis. Any recommendations by the Advisory Committee will be presented to the Sanatorium Board for final consideration.

The Medical History Club of Winnipeg met in the Medical Arts Club rooms on April 25th. After dinner Professor R. O. MacFarlane, head of the Department of History of the University of Manitoba, addressed the members on "The practice of medicine in colonial New England". The paper was discussed by Dr. John Hillsman and others. It was decided to hold the next meeting at the Lower Fort Garry, when the address will be given on the history of the fort, now over 100 years old.

Dr. Gerald S. Williams, Superintendent of the Children's Hospital, Winnipeg, has left for London where he will take up administrative work with the R.C.A.M.C. Dr. Williams occupied a similar position in the war of 1914-18.

Dr. David Swartz has been appointed Assistant Urologist to the Winnipeg General Hospital.

Dr. Gerard Allison has been appointed Editor of the *Manitoba Medical Review*, the organ of the Manitoba Branch of the Canadian Medical Association.

ROSS MITCHELL

New Brunswick

Dr. A. M. Clark, who for some time past has been District Medical Officer at Woodstock, N.B., has now been transferred to Saint John. Dr. Clark took a very active part in medical and hospital matters, while a resident in Woodstock. He was recently the guest of honour at a farewell party tendered by the hospital staff and practitioners in Woodstock.

The Minister of Health, Hon. J. A. Doucette, speaking in the New Brunswick Legislature on April 24th, stated that a fourth tuberculosis sanatorium is necessary in New Brunswick. This, in spite of the fact that the death rate from tuberculosis has been reduced from 107.2 to 77.3 for 100,000 of population in the years from 1934 to 1939. At the same time the Minister stated that at present it would be impossible to provide suitable accommodation for the feeble-minded.

Dr. W. H. Coffyn, of Bathurst, has returned to his home from Halifax where he had been undergoing medical treatment. His health is much improved.

Dr. H. M. Gardner, of Minto, has returned home following medical treatment and a short holiday in Ontario.

Capt. A. A. G. Corbet, R.C.A.M.C., was re-elected president of the Saint John Red Cross Society at the April meeting.

Dr. William Frost, until recently Senior Resident at the Saint John General Hospital, has been appointed to the Canadian Quarantine Service at Halifax.

According to the press, a new hospital will be built in Bathurst, N.B. Work will begin in approximately two months. The hospital will be operated by the Sisters of the Hotel-Dieu who already conduct hospitals at Chatham, Campbellton, Tracadie and St. Basil.

No doubt the meeting of the Maritime Conference of the Canadian Medical Association will be reported

elsewhere. Nevertheless, it is a pleasure to state that this conference appeared to be a very marked success. A total attendance of sixty-five speaks well for the interest exhibited in a spring meeting of this type.

Capt. A. A. G. Corbet, R.C.A.M.C., attached to the R.C.A.F., has been transferred temporarily to Halifax.

A. STANLEY KIRKLAND

Nova Scotia

The placing of silicosis on the list of compensatory industrial diseases was an amendment to the Nova Scotia Workmen's Compensation Act, introduced in the Legislature by Hon. L. D. Currie, Minister of Mines. While considered rare in the province's coal mining districts, certificates were shown to the government by the United Mine Workers' committee, indicating that four Springhill miners had been boarded out of the Canadian Active Service Force because of silicosis.

Several of the 32 "iron lungs", given to Nova Scotian hospitals by Lord Nuffield, have arrived and been installed.

Dr. Harold Robertson (Dalhousie, '27), was awarded in 1939 the degree of Master of Public Health, by Johns Hopkins University. Dr. Robertson is attached to the Provincial Department of Public Health.

Dr. J. Howard Buntain (Dalhousie, '35), has taken over the practice of Dr. J. A. Langille, Pugwash. Dr. Langille is on active service.

The provincial profession, now on active service, includes: Lieut.-Col. J. G. D. Campbell, Capt. C. M. Jones, Capt. J. A. Noble, Capt. H. C. S. Elliot, Capt. Harold Robertson, Capt. G. A. Winfield, Lieut. J. S. Miller, Major T. M. Sieniewicz, Lieut. W. G. Morson, Lieut.-Col. V. O. Mader, Major G. R. Burns, Capt. E. F. Ross, Capt. C. M. Bethune, Surgeon-Lieut. C. C. Stoddard, Lieut. B. W. Maclellan, Capt. W. D. Rankin, Lieut. J. F. Hopkirk, all of Halifax; Major F. F. P. Malcolm of Dartmouth, Capt. B. F. Miller of New Waterford, Lieut. D. R. Sutherland of Middle Musquodoboit, Major J. W. Sutherland of Amherst, Capt. F. E. Walsh of Springhill, Capt. H. F. MacKay and Lieut. G. R. Douglas of New Glasgow, Capt. G. R. Forbes of Kentville, Capt. H. R. Ross and Lieut. C. A. MacDonald of Sydney, Lieut. H. F. Sutherland of Glace Bay, Lieut. W. J. Lamond of Sydney Mines, Lieut. J. A. Muir of Port Hawkesbury, Lieut. J. A. Langille of Pugwash, Capt. C. R. Trask of Sheet Harbour, Lieut. W. H. Embree of Scotsburn, Lieut. G. P. Tanton of Port Dufferin, Lieut. E. A. Fergusson of Weymouth, Lieut. Miller MacKay of New Glasgow.

ARTHUR L. MURPHY

Ontario

To mark the Fellowship in the Royal College of Physicians, London, conferred upon Dr. Alan Brown, of the Hospital for Sick Children, his associates in the hospital entertained him to dinner at the Toronto Hunt Club on April 26th.

To mark his long association with the Preventorium of the I.O.D.E., now the I.O.D.E. Hospital for Convalescent Children, the Board of the Hospital presented Dr. Harold C. Parsons with a piece of silver plate suitably inscribed in recognition of his devoted service since the opening of the institution in 1913.

St. Joseph's Hospital, Sudbury, entertained Dr. W. C. Morrison at dinner on May 1st to mark fifty years in active practice. Suitable presentations were made to both Dr. and Mrs. Morrison who, in this long period of residency in Sudbury, have done much for the community.

J. H. ELLIOTT

Everything OK in the OB

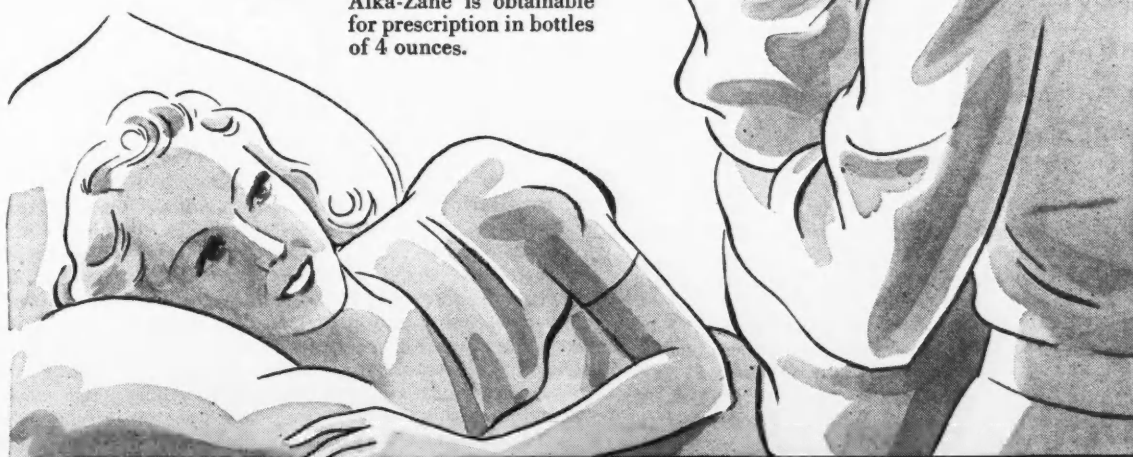
*Another newcomer in the OB,
and "mother and baby are doing fine" . . .*

This reassuring report may have been in no little measure the result of good prenatal care. Preserving the mineral balance and prevention of acidosis were important parts of the prophylactic routine during pregnancy.

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Quebec

The Royal Victoria Hospital, Montreal, has issued a bulletin to acquaint the practitioner with those activities of the Hospital which are of value for post-graduate instruction. It is hoped to publish annually in September a similar bulletin, and in January and June a simple supplement containing hospital news items and announcement of additional lectures, meetings and courses. In addition a program of special activities is issued monthly.

All information with regard to this program can be obtained on application to the Secretary-Treasurer, Dr. J. F. McIntosh, Royal Victoria Hospital, Montreal. The program of lectures, courses, and clinics is very comprehensive and something can be found there to suit the requirements of every medical man.

Dr. E. W. Archibald, Emeritus Professor of Surgery of McGill University, and Professor P. Masson, of the University of Montreal, received the Honorary Degree of Doctor of Science from McGill University at the recent Convocation.

General

The 40th Annual Meeting of the **Canadian Tuberculosis Association** will be held at the Windsor Hotel, Montreal, on June 24th, 25th and 26th. This convention is being held in conjunction with the Mt. Sinai Summer School Post-graduate Course in Tuberculosis which takes place on June 27th, 28th, 29th and 30th. A very full and appropriate program has been prepared.

Those attending the meetings are cordially invited to visit the following institutions, which will be open for visitors every morning during the session.

Bruchesi Institute, 1464 Saint Hubert Street.
Royal Edward Institute, 3674 Saint Urbain Street.
Municipal X-ray Clinic, 305 Mount Royal E.
Grace Dart Home Hospital.
Sacred Heart Hospital, Cartierville.

The officers of the Association are: *President*, John McEachern, Winnipeg; *President-elect*, Dr. J. A. Jarry, Montreal; *Executive Secretary*, Dr. G. J. Wherrett, Ottawa.

Medical Library Association.—The forty-second annual meeting of the Medical Library Association will be held at the University of Oregon Medical School, Portland, June 25th to 27th, under the presidency of Col. Harold W. Jones, of the Army Medical Library, Washington, D.C. Hotel headquarters will be at the Heathman. The program will include talks on the literature of epidemiology of plague, tularemia and Rocky Mountain spotted fever; a symposium on investigations in local medical history; and problems in bibliography based on a study of terminology in the field of nutrition.

The Fifth Annual Convention of the **National Gastro-enterological Association** will be held on June 4, 5, and 6, 1940, in New York, at the Hotel Roosevelt, 45th St. and Madison Ave.

The President is Dr. Anthony Bassler, of New York, and we note that the Second Vice-president is Dr. C. J. Tidmarsh, Montreal. Among Canadians taking part in the program are Drs. Lionel Marks, of Toronto; F. W. Rolph, Toronto; C. J. Tidmarsh, Montreal; E. E. Cleaver, Toronto; B. P. Babkin, Montreal; J. D. Adamson, Winnipeg; G. G. Miller, Montreal; T. H. Cuddy, Winnipeg.

The Committee of the **Fourth International Otorhino-Laryngological Congress** regret that they are obliged to give notice of their decision to postpone the Congress for an indefinite time. H. Burger, President; A. Marres, Hon. Secretary.

The **Finney-Howell Research Foundation Inc.**, desire to announce that January 1, 1941, has been fixed as the closing date for filing applications for awards in 1941. William A. Fisher, M.D., Secretary-Treasurer, 1211 Cathedral St., Baltimore, Md., U.S.A.

Book Reviews

British Encyclopædia of Medical Practice. Edited by Sir H. Rolleston. Cumulative Supplement, 170 pp.; Surveys and Abstracts, 605 pp. \$7.50. Butterworth Co. of Canada, Toronto, 1940.

The first volumes of the supplementary system to this encyclopædia have now been received, in spite of the war. This slight delay is the only effect produced on this plan of publication. The volumes themselves contain an extraordinary mass of material. The first of the two is a supplement, cumulative in nature, and presenting information made available since the main body of the work was published. The material is admirably presented in a compact and comprehensive matter. Later volumes will contain the preceding ones, so that there will be uninterrupted continuity. The method of key numbers to each article makes reference to the main encyclopædia very simple.

The second volume is even more ambitious. It contains three sections: (1) Critical surveys, which are a lengthy series of reviews on a variety of subjects, by well known authorities: *e.g.*, Sir Arthur McNalty writes on "The State and National Health", Sir Frederick Still on "Disease in Children", E. C. Dodds on "Endocrines", Colonel Harrison on "Venereal Diseases"; and many others. No. 2 contains articles on recent advances in pharmaceutical knowledge, *e.g.*, a complete review of our knowledge of the sulfanilamide drugs. No. 3 is a carefully selected group of abstracts from recent medical literature, bringing the volume well up to date.

The whole plan of these supplementary volumes is deserving of high praise. The work of the contributors and the arrangement of their material has been most carefully edited, and the result is not so much a supplement as an extension of a very valuable storehouse of medical information.

The Electrocardiogram and X-ray Configuration of the Heart. A. M. Master. 122 pp., illust. \$6.50. Lea & Febiger, Phila., 1939.

This book shows in atlas form the important effects upon electrocardiographic tracings of alterations in the position and shape of the heart, especially in so far as they may be confused with the changes associated with muscle damage. First, is considered the effect of age. Next are illustrated the factors of respiration, body position, habitus, obesity, and pregnancy. Alterations in the QRS complexes and T-waves which reflect hypertrophy and enlargement of the chambers themselves (in the absence of degenerative changes) are described under the headings of hypertension, acquired valvular disease, and congenital lesions. Lastly there are recorded the effects upon the electrocardiogram of various pulmonary diseases, including spontaneous pneumothorax, in which condition coronary occlusion may be simulated.

This is not a textbook on electrocardiography and roentgenology of the heart, nor does it contain much that is new. Nevertheless it comes at a time when there is general realization that our knowledge as to what constitutes a normal tracing is inadequate, and it re-emphasizes in an interesting manner facts that are often overlooked. Its appeal will be, as the author intends, to "that large number of physicians now taking and interpreting electrocardiograms without the study and application necessary for doing this

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properly." To them it will be of real value, especially to those who learn "visually".

We would call attention to a few minor errors: The same type of main QRS-3 deflection is called in fig. 25 a Q-wave, and in fig. 26 an S-wave. It is not in accordance with established usage to refer to the hypertensive heart as a *cœur-en-sabot* (p. 96). The unfortunate mistake is made throughout of putting an unwanted letter "o" into the word "teleroentgenogram": the derivation is from $\tau\eta\lambda\epsilon$, not from $\tau\epsilon\lambda\epsilon\sigma$.

Cardiovascular Diseases. D. Scherf and L. J. Boyd. 458 pp. \$6.25. Macmillan, Toronto, 1940.

This book is not intended to be a complete textbook on cardiovascular disease. Its 450 odd pages could not possibly cover the field. As the authors state, its important function is to supply information on various cardiovascular problems, both practical and theoretical. A large part of the book is taken up with discussions of cardiac topics of the usual nature. There is a really excellent chapter on congenital heart disease, which simplifies the subject for the uninitiated. The subject of pulmonary embolism is considered at greater length than is usual in most textbooks. This condition is considered a rarity by most physicians, but there can be no doubt that it occurs more frequently than is suspected.

Peripheral vascular disease is taken up in a rather sketchy manner, and could have been omitted altogether without great loss to the value of the book.

A number of pages are devoted to the treatment of heart disease in general. The book is very readable but occasionally the discussions are prolonged unnecessarily. To the man in general medicine who requires a discussion of problems in heart disease which are not too involved this can be recommended as an excellent book.

Cardiovascular-renal Disease. L. W. Smith, and others. 227 pp., illust. \$4.50. University of Toronto Press, 1940.

As the authors state on the title page, this is a clinico-pathological correlation study emphasizing the importance of ophthalmoscopy. The book is based on material shown at the scientific exhibit of the American Medical Association at San Francisco in 1938. The authors have set out briefly and clearly the clinical, ophthalmoscopic, pathological and laboratory findings in essential hypertension, malignant hypertension, the arteriosclerotic kidney, nephritis and nephrosis.

The natural history of hypertensive renal disease is well outlined and the essential differences between it and the kidney of senile atherosclerosis clearly defined. The significance of the recent experimental work in the production of hypertension is discussed. The authors deal with the classification of nephritis along soundly recognized lines. Two valuable chapters deal with the relationship of eclampsia and pyelonephritis to hypertensive vascular renal disease. The ophthalmoscopic appearances are admirably presented with photographs and diagrams. The book includes many useful charts and an excellent bibliography.

This work can be recommended to practitioners who wish a clear-cut, concise description of cardiovascular-renal disease.

A Symposium on the Blood and Blood-forming Organs. Various authors. 264 pp., illust. \$3.50. University of Wisconsin Press, Madison, 1940.

The present volume is an admirable example of what a symposium should be and how successful it may be in covering a field of knowledge. It presents the collected papers read at the Institute for the Consideration of the Blood and Blood-forming Organs held under the auspices of the University of Wisconsin Medical School in September, 1939. The authors are established authorities on the subject. There is no writing over the head of the average physician. The

main facts with regard to nearly every aspect of hæmatology are set forth with the balance well held between the experimental and the clinical, the laboratory considerations and the practical phase of treatment.

The discussion of the types of leukæmia by Forkner is a particularly fine piece of work and would seem to be the best concise presentation of the subject which has yet appeared. An equally fine example of medical exposition is the summary of our present knowledge of Hodgkin's disease by Krumbhaar. These two contributions alone make the book invaluable to the clinician. The newer fundamental scientific aspects of the subject are to be found in discussions of the iron deficiency anæmias, the nature of hæmolytic anæmia, the reticulo-endothelial system, and the present status of the blood coagulation problem, including heparin and vitamin K.

At a time when our knowledge of the blood diseases is changing so rapidly frequent siftings and summaries of results are a necessity. This volume provides such a service for clinical pathologists, internists and general practitioners.

Illustrations of Surgical Treatment. L. Farquharson. 338 pp., illust. \$6.00. Macmillan, Toronto, 1939.

This most attractive book is almost unique in its plan. Sir John Fraser, in an appreciative foreword, says that Mr. Farquharson has a reputation for ingenuity. This statement is readily appreciated after one has read the text and studied the numerous diagrams, line drawings, photographs and reproductions of x-ray films that so liberally illustrate the points made.

The technique of continuous intravenous infusion and transfusion of blood is admirably presented but the bulk of the text is taken up with orthopaedic conditions and the methods of handling common fractures and dislocations. The influence of Böhler is very evident, but the author presents many modifications of application of Böhler's principles that are logical and practical. Any house surgeon or junior surgeon should find just the help he needs, and it would not be time ill spent should the senior surgeon avail himself of many very valuable hints in the handling of certain fractures. Manipulation of the knee and the "tennis elbow" are well described. One curious slip occurs when local anæsthesia is suggested in the reduction of Colles' fracture. The author advises the use of "10 c.c. of a 2 per cent solution" but does not mention the potent drug in the solution.

Comment on the last hundred pages is difficult. This section consists of plates illustrating instruments used in all manner of surgical procedures. It would make an excellent epitome of an instrument maker's catalogue, but the intention of the author is plain in that it shows the tyro the best tools for a given purpose.

The book is no substitute for any work on practical surgery but is full of ideas for the reader who already knows a good deal about surgical handcraft.

Fractures, Dislocations, and Epiphyseal Separations. H. C. W. S. DeBrun. 468 pp., illust. \$3.00. Year Book Publishers, Chicago, 1940.

Two welcome features of this book are the convenient size and the reasonable cost. The tone is dogmatic and the illustrations helpful.

The methods of treatment described are in general the orthodox procedures presently in use in this country, as well as a number of special departures for which the author is responsible—for example, his method of treating fractures of the calcaneus. The tables of average time of healing of various fractures, and the brief chapter on disability ratings are practical additions of a most useful kind. There can be little profit in dispute over details, but it must be rare indeed to find a fracture of the carpal navicular that requires only two weeks' immobilization in plaster. It is also surprising to find no mention of lateral

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films of fractured femoral neck in the chapter on x-ray examination.

Purists must be prepared for a few mild shocks in the use of the language (the verb "tract", meaning to pull—"cast" instead of casing), but these features interfere in no way with the clearness of the descriptions and instructions.

Rectum and Colon. E. P. Hayden. 434 pp., illust. \$5.50. Lea & Febiger, Phila., 1939.

This book is written primarily for the instruction and information of the general practitioner, to bring his conception to present-day standards. Most of the material has been compiled from the clinic of diseases of the rectum and colon at the Massachusetts General Hospital. The illustrations are of enhancing value to the text and are appropriately placed. The recent work of several other rectal surgeons, Lockhart-Mummery, Gabriel and others, has been discussed and taken into consideration in evaluating the end-results and therapeutic steps in such minor surgery as is given in detail; the end-results of major surgery of the colon and rectum are given and sufficiently elaborated to allow the practitioner to feel he is not grossly uninformed in referring these cases to the specialist. Of particular value is the description of examination of this region which contains so much clinical material which could be properly and amply treated by the well-informed family doctor. There are several minor points, still controversial, upon which the author has formed conclusions, but on the whole the contents should help the able man who wishes to practise medicine as fully as his conscience will allow.

Sclerosing Therapy. Edited by F. C. Yeomans. 336 pp., illust. \$6.00. Williams & Wilkins, Balt., 1939.

Dr. Yeomans has chosen Bratrud of the Clinic for Ambulant Treatment of Hernia, University of Minnesota, to write on hernia; Hoch, of St. Luke's, New York, to write on hydrocele; Shelley, of St. Luke's, New York, to write on varicose veins, and has himself written the chapters on hemorrhoids. There is insufficient space to review the injection treatment of hernia but primarily two conditions must be present; the surgeon must be equally as capable with diagnosis, the scalpel and the needle (a good surgeon), and the patient must be able to produce good fibroblastic tissue; there are many other lesser conditions. Hoch classifies hydroceles as idiopathic and symptomatic, acute and chronic. He advises the use of quinine hydrochloride and urethane in only the idiopathic. The contraindications to varicose vein injections are listed as absolute and relative. The absolute are (A) general; (1) major cardiovascular disease, cirrhosis of the liver; (B) local; (1) impairment of arterial circulation; (2) lack of patency of deep veins. The relative are those temporary conditions which may be cleared up, such as infection (general and local), etc., and then injection proceeded with, but also the patient must be ambulatory. On the whole this is a masterly treatise on injection as a form of treatment of these four disease entities.

Proctology for the General Practitioner. F. C. Smith. 386 pp., illust. \$4.50. F. A. Davis, Phila., 1939.

In this very interesting book Dr. Smith has succeeded in giving a very concise and practical outline of Proctology for the general practitioner. The book is well arranged. It opens with a discussion of the symptoms of ano-rectal disease, and the conditions most likely to cause these.

The author then gives a good outline of the diagnostic measures employed in proctology, stressing history and a detailed examination. Following this, each phase of ano-rectal pathology is discussed in detail under symptoms, diagnosis, with particular attention to treatment. Excellent illustrations are to be found throughout the book.

The inclusion of chapters on pilonidal sinus and cyst, intestinal parasites, constipation and diarrhoea in a book on proctology may be questioned, but when one considers that it is intended for the general practitioner such inclusions seem justified.

In the chapter on benign and malignant neoplasms, the author includes a fairly detailed account of the operative technique necessary for their treatment. In a book of this nature an outline of major surgical procedures perhaps does not seem necessary.

This book should prove to be of great help to the general practitioner, because he is the one who is usually the first to be consulted when rectal signs and symptoms make their appearance.

Combined Textbook of Obstetrics and Gynecology.

3rd ed., edited by J. M. M. Kerr and others. 1192 pp., illust. \$11.25. Macmillan, Toronto, 1939.

The new edition of this valuable textbook has been completely revised and brought up to date. The book remains lucid and comprehensive, but not burdened with unnecessary details. The newer physiology of the female reproductive system is concise but complete, and the authors have skilfully avoided controversial phases of the subject. No unnecessary illustrations are included, but there are sufficient for complete illustration of the text. The chapter on Radiography in Obstetrics summarizes the subject in an excellent manner for the student and general practitioner, but a fuller discussion on radiography in gynaecology might have been of value.

The work is an excellent textbook for students or practitioners.

Handbook of Diseases of Infants and Children. F. M. B. Allen. 2nd ed., 415 pp., illust. \$5.50. Macmillan, Toronto, 1940.

In this edition among other chapters that on infant feeding has been rewritten. The author's views on this subject coincide in many instances with those held by Canadian paediatricians. However, Canadian physicians would not care to feed raw milk with the idea that minimal doses of infection with tubercle bacilli received at intervals would be of value in protecting against military tuberculosis. The use of the longitudinal sinus as a route for blood transfusion would not be considered safe in Canada, and of course non-grouped blood would not be injected intravenously even in the newborn. The value of cream of baked potato in the treatment of scurvy, when the daily dose recommended would contain a total of less than 1 mg. of ascorbic acid, is exceedingly doubtful.

Fundus Atlas. L. Bothman and R. W. Bennett. \$17.00. The Year Book Publishers, Inc., Chicago, 1940.

The authors have arranged on separate cards stereoscopic photographs of the fundus oculi. In all, fifty cards are presented. On each there is a short history and description of the case illustrated. Most of the important and interesting changes met with in the fundus are included. The photographs are in black and white and have been considerably enlarged. Black and white photographs of the fundus have only a limited value for teaching purposes, but their failings are somewhat discounted when the pictures are seen stereoscopically. This is particularly well illustrated by the photographs of such conditions as colobomata of the optic nerve.

A Guide to Ophthalmic Operations. J. B. Hamilton. 201 pp. 10s. 6d. H. K. Lewis, London, 1940.

This book is a compilation in detail of all procedures, except those of actual surgical techniques, required for the care of surgical ophthalmic patients. It includes the pre- and post-operative care of these, the selection and care of instruments, anaesthetics and other drugs, for all important surgical operations on the eye. Even though each hospital differs slightly in certain details in these

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regards the book is of great value, particularly to those hospitals having training courses for nurses, or which are connected with schools of medicine. It is a very easily read and "handy" little book.

Reports on Medical Progress. Compiled by R. N. Nye. 562 pp. \$5.00. Little, Brown & Co., Boston, 1940.

It is well known that the journals contain numerous and excellent reviews of recent advances, and as well bring things up to date. But these usually are concentrated and cannot be merely glanced over. Therefore the collection of these into book form, as in the present case, is extremely valuable. The reports included in this volume are not actually complete reviews so much as statements on particular aspects of each subject that have proved to be of value in diagnosis and treatment. The subjects are carefully selected from both medicine and surgery, and no one will fail to find something in his own particular line of work. The men chosen to write the articles have the authority of long experience. Many of the outstanding names in American medicine are included. Altogether the book contains a very considerable amount of well assorted, well digested material, and can be highly recommended.

New Facts on Mental Disorders. N. A. Dayton. 486 pp. \$4.50. C. C. Thomas, Springfield, 1940.

This book is the outcome of a project which, as the author states, was set up with the thought of studying the problem of mental disorder as a whole rather than analyzing the mental disorder of the individual. In it are contained the findings of the analysis of various factors related to mental disorder as found in 90,000 admissions to mental hospitals during the period 1917 to 1933.

Such special topics as age, nativity, alcohol and marital status as related to mental disorders are given special consideration. It is interesting to note that on the basis of this study, Dr. Dayton believes that mental disorder is largely a disease of old age, and points to the fact that, while between the age period 30 and 59 the admission rates to mental hospitals have been increasing moderately above the age of 60, they rise precipitately to the high point which is reached in the age-period 80 to 89. He states that the admission rate in the 80 to 89 year age-group is 19 times as high as that of the 10 to 19 year age-group and concludes that the accumulating assaults upon the physical organism by the wearing-out process, apparently results in death in some persons and in mental disease in others. Mental disease, he states, thus becomes a general disease of the declining physical organism.

The findings in this study are very clearly summarized in a brief introduction to each chapter and numerous graphs help to illustrate the text.

This book will be of special interest to the psychiatrist and the physician who is interested in the general problem of public health.

Standard Methods of the Division of Laboratories and Research of the New York State Department of Health. A. B. Wadsworth. 2nd ed., 681 pp. \$7.50. University of Toronto Press, 1940.

This book, now in its second edition, gives the standard methods used in the well known and very efficient Division of Laboratories and Research of the New York State Department of Health. Not only are the technical laboratory procedures given in detail but the general organization and management of the department is also set forth in a concise and clear manner.

The scope of the book can best be presented by summarizing its table of contents arranged under the follow-

ing sections: (1) General laboratory procedures, including bacteriological technique, the use of experimental and test animals; the very important matter of the collection of material for bacterial examination and methods of quantitative chemical analysis. (2) Methods used in the department for the preparation of media, glassware and diagnostic outfits. (3) Methods used in the diagnostic laboratories. (4) Methods used in the laboratory for sanitary and analytical chemistry. (5) Methods used in the antitoxin, serum and vaccine laboratories. Included in this section is the care and breeding of laboratory animals. (6) Methods used in the administrative offices. (7) Methods used in the research, publications and library department.

Included in the text are new and important procedures and important changes in technique particularly relating to the quantitative technique in the complement fixation tests, the revised colloidal gold test and methods in the production, concentration and standardization of certain therapeutic sera.

Standard Methods is probably of greatest interest to those responsible for public health laboratories and hospital laboratories, but it is also an exceedingly useful reference book for any one using such health laboratory services. Especially is this the case in the matter of proper collection, preparation and dispatch of material to be sent to the public health laboratory, a matter which is so often neglected, with the result that the material is rendered useless. The matter of interpretation of results is also very important to the practising physician and standard methods give him the necessary information.

Supervision in Public Health Nursing. Violet H. Hodgson. 376 pp. \$2.50. Commonwealth Fund, New York, 1939.

This book is on a phase of public health nursing not emphasized in other texts, namely, the responsibility of the supervisor in the development of her organization and in the professional advancement of her nurses. Principles and methods of organization and administration are reviewed, and there are chapters on field visits, clinic work, group conferences, reports, affiliating students and volunteers, and on the supervision of school and industrial services. Very soundly, this work emphasizes basic principles in the development of the individual worker.

Hypothalamus and Central Levels of Autonomic Function. 980 pp., illust. \$10.00. University of Toronto Press, 1940.

The proceedings of the Association for Research in Nervous and Mental Disease, December 20 and 21, 1939, New York.

Field Ambulance Organization and Administration. J. H. Neill. 128 pp. 5s. H. K. Lewis, London, 1940.

An exceedingly useful little manual for the numerous medical men now interested in ambulance work.

Essentials of the Diagnostic Examination. J. B. Youmans. 417 pp. \$3.00. Commonwealth Fund, New York, 1940.

A compact and clearly written manual on physical examination.

Modern Treatment in General Practice. Yearbook 1940. Edited by C. P. G. Wakeley. 312 pp. \$3.75. Macmillan, Toronto, 1940.

Concerning a wide variety of subjects, which are dealt with by men of experience and authority.

